P

Vol.

"Tr
or at
sent n

Wo

Re

Le
Fa
Mo

Th

Ar

Ha

Ou

"

THE PRACTICAL TEACHER

With which is incorporated

THE PRACTICAL TEACHER'S ART MONTHLY

"It is to be noted that when any part of this paper appears dull, there is a design in it."—*Steele.*

Vol. XXXI. No. 5. NOVEMBER, 1910. Price 6d.

Notices to Correspondents and Subscribers.

"The Practical Teacher" may be ordered of any Newsagent or Bookseller, or at any Bookstall, in the United Kingdom or in the Colonies. Supplies are sent monthly to the chief towns in Australasia, South Africa, and India.

London Office: 35 and 36 Paternoster Row.
Edinburgh Office: Parkside Works.
Dublin Office: 17 Talbot Street.
New York Office: 37 East 18th Street.
Paris: W. H. Smith and Son, 248 Rue de Rivoli.

Subscribers may obtain "The Practical Teacher," post free, from the Publishers at the following terms:—

United Kingdom, Continent, Colonies, and United States } 12 Months, 8/- 6 Months, 4/-

All literary communications should be addressed to the Editor, Office of "The Practical Teacher," 35 and 36 Paternoster Row, London, E.C.

Remittances, Cheques, Post-Office Orders, etc., should be made payable to Thomas Nelson and Sons. Advertisement rates on application.

CONTENTS.

Wood-carving in Switzerland. By Julian Grande, F.R.G.S. 298

Religion, Morals, and Manners. A Course of Bible Teaching for the School and Home. By J. Eaton Feasey 300

Learning by Doing. By J. Cuthbertson, M.A. 302

Far and Near 303

Modern Psychology and the New Methods in Education. By W. H. Winch, M.A. (Cantab.) 306

The Organisation of Juvenile Employment. By John Perkins 307

An Interesting Experiment: A Holiday School in Town 309

Handwork in Rural Schools. By W. Francis Rankine 311

Our Art and Handwork Section—

- Needlecraft for Primary and Secondary Schools. By Ann Macbeth and Margaret Swanson. 313
- Drawing in Public Elementary Schools. By David Summerson 317
- Honours Page 320
- Art and the Book. By W. E. Sparkes . . . 322
- The History Lesson and Drawing. By W. H. Elgar 327
- Educational Handwork. An Experiment in the Training of Teachers. By J. Tipping . . 331
- Colour Arrangements. By Agnes E. Farman . 332
- Editorial Note 332
- Direct Brush Studies in Black and White . . 335

"The Practical Teacher" Technical Scholarships 337

Our Photographic Column. By T. A. Briggs 339

A New Course of Practical and Constructive Work. By A. R. Pickles, M.A., and Dalton Grange 340

Our Needlework Column. By J. A. Fleming. Common-sense Comfortable Clothing for Children 343

Back to the Land. The Experiences of a Novice 346

A Tale for the Story Hour. By M. Bayne 347

Song—"A Summer Wish." Words by C. G. Rossetti. Music by F. H. Squires, F.R.C.O. 349

Modern Science Notes. By J. G. McIntosh, B.Sc. 352

Practical Notes on School Gardening for November. By Bruce Cook, F.R.H.S. 353

N.U.T. Notes. By Allen Croft . . . 356

Juvenile Street Traders 357

Experiments in Dramatic History. By Fred. E. Melton, Shenley, Bucks . . . 358

Scripture Lessons for Young Children. By Mrs. Florence Kirk 360

Our Query Column 362

French Prize Competition 365

Fairy Tales. The latest Method of Teaching English 366

The Teacher and the Art of Correct Speech. By Herbert Leather . . 367

The Course System in Evening Schools 368

The Editor's Bookshelf 369

Wood-carving in Switzerland.

BY JULIAN GRANDE, F.R.G.S.

(*Continued from page 232.*)

THE young student begins by learning to chisel a straight line. He then passes on to the simple curves of a conventional lily, then to more difficult curves, then to a clover leaf, and then to more complex leaves, such as oak leaves. After that he passes to the long spiral curves of a snail's shell, after which he may attempt the carving of a flower, such as edelweiss. In every case he must first make a drawing of his model, just as in the case of figures he must also learn how to make a clay model first.

In the school the students have a good supply of stuffed animals, birds, and skeletons, from which they draw. Outside the school they have a little park, where chamois, bouquetins (Steinböcke), stags, golden eagles, and other animals are kept. To this park the students must go in order to observe the animals and birds in their various attitudes.

Moreover, those specialising in figure carving have to study human anatomy, and those specialising in animal carving must study animal anatomy.

Last year only five scholars out of about fifty specialised in the human figure, twelve specialised in animal carving, six in foliage and ornamental carving, and only one in flowers.

The following subjects are compulsory: clay-modelling, seven hours a week in summer, and six in winter; freehand drawing, five and a half hours a week in summer, and four and a half hours in winter; and various styles of ornamental wood-carving, one and a half to two hours a week. Besides these subjects, bookkeeping, commercial correspondence, and accounts take up two hours a week in the technical continuation school. Those who are behindhand in knowledge of technical drawing receive special instruction in this branch of knowledge.

PICTURE CARVED IN WOOD, FROM THE ORIGINAL BY ED. GIRARDET, AND REPRESENTING A VILLAGE AUCTION IN BRIENZ.

During the first year the work of the pupils is naturally not good enough to be put on the market. In the second year, however, their work is usually saleable, and they receive fifty per cent. of the proceeds of any sales. Some of them earn a considerable amount.

The ordinary course lasts three years, but those who specialise in face and figure carving must remain at least four years in the school. Wood-carved pictures and busts are becoming very popular. No matter how complicated a drawing or painting may be, the wood-carver's chisel can execute an exact reproduction of it. The above picture copied from the original by Ed. Girardet, the well-known Swiss artist, represents a Brienz

village scene, and its execution occupied the carver seven months. It was finished the very day I visited Herr Binder's celebrated works at Brienz.

I asked Herr Binder whether the artist worked at anything else during these seven months. "Oh yes," replied the master wood-carver. "He would have gone mad if he had done nothing else." The faces as shown in the photograph, taken from the woodwork, are no whit less expressive than in the original picture, which I saw; and the way the figures stand out, and especially the perspective of the church and chalets in the background, represent the highest pitch to which the wood-carving art has yet attained.

Face and figure carving is naturally the best-paid branch of the work. "The Wrestler" is an excellent example of the human face and figure carved in wood. By the way, it may not be generally known that, next to rifle-shooting, wrestling is the most popular national sport in Switzerland. A wrestling match is certain to draw crowds, and this statue is a lifelike representation of a modern Swiss wrestler about to enter the arena.

A Swiss Wrestler about to enter the Arena. Carved in Wood.

Another portrait carved in wood, which struck me as singularly expressive, was that of an old Brienz peasant, or *Bauer*, whose character has been admirably brought out by the artist. This old fellow is still living in Brienz, and any one who has seen the bust or the photograph here reproduced will have no difficulty in recognising him.

The wood used by preference for carvings is walnut, which is procured locally. It can be used when freshly cut, but is much the better for having been left to season for a couple of years. Oak is employed for heavy furniture; maple occasionally for small, light articles; while for some of the finer kinds of carving, lime-tree wood and especially pear wood are used. For the very finest work of all, it is pear wood which is chosen. My bust of Melchior Anderegg, for instance, previously referred to, is carved in pear wood by Huggler.

The demand for wood-carved articles is becoming general. Umbrella handles, jewel boxes, brushes, clocks, armchairs, and picture frames are in great request in German-speaking countries.

A good many women are employed in the wood-carving industry, but what they do is mostly varnishing or making cigar-boxes, inkstands, and other light articles. The finer kinds of wood-carving work, as well as the large pieces of statuary, require not only a big brain,* but big muscles as well, and are beyond a woman's strength.

A great many wood-carved knickknacks are sent to Austria and Norway. This year thousands of carved crucifixes have been sent to Ober-Ammergau, where, of course, as in other places, they have been palmed off as local work on unsuspecting tourists.

The prices of wood-carved articles naturally vary exceedingly, some costing only a few pence, others hundreds of pounds. The fashion in carved umbrella handles for next year seems to be, in France, chanticleers; in Germany, foxes; in America, bears; in Russia, parrots; in Italy, monkeys; in Belgium, hares; and in England, lions.

The people of Brienz engaged in the wood-carving industry develop a dreamy and picturesque appearance. They have much innate good taste; and although some of their carvings would have brought down upon them the execration of Ruskin, on account of the lack of simplicity of design and the over-ornamentation, yet, on the whole, they show great fidelity to Nature.

Brienz itself is in many ways a characteristic Swiss village. It contains one long street, and the most conspicuous buildings are the carving school, Binder's works, the schoolhouse, and the old church. The chalets are kept cool in summer and warm in winter by the stacks of wood piled up outside them.

Every chalet has its own garden, with vegetables, fruit, and flowers all growing together. Across the front of many, a vine or plum or pear tree is trained. The pears and apples not eaten in summer are dried in the big ovens, strung together, and stored for winter use. At whatever time of day a visitor enters a chalet, he will certainly find the coffee-pot on the hob, and the inhabitants probably taking a cup of coffee and nibbling a piece of bread. The Brienz people are all

* The Editor takes no responsibility.

related more or less closely. In point of fact, the wood-carvers here form a little world of their own, and they are very jealous of newcomers. No one would take them for open-mouthed yokels, which indeed they are not. If some of them are not artists by training, they are certainly artists by nature.

Something of the old simplicity has departed from Brienz, but many old customs and costumes are rigidly preserved. The great event of the year occurs in the month of November, when the annual fair is held—a very ancient institution, formerly accompanied by a good many customs much more honoured in the breach than the observance. On this occasion even the carving school is closed for four days. The reason why the fair

Study of a Brienz Peasant Head. Carved in Wood.

is held so late as November, which, by-the-bye, is often very pleasant and sunny at Brienz, is that the people have no time for merry-making earlier in the year. They have first their gardens to get in order after the winter; then their hay to bring in; then comes the tourist season, which means a great deal of extra employment for the women and men alike; and finally, the preparations for the winter again. The fair is in reality a kind of thanksgiving festival. People come to it from all the countryside. Every house is filled with guests, and for three days the place is given up to merrymaking. Feasting and dancing and general "jollification" are the order of the day. The Brienz annual fair has been the subject of some of the best and most popular pictures in wood-carving.

[Next month Mr. Grande will describe the Swiss Technical School Course which is designed to prepare waiters for hotel work.]

RELIGION, MORALS, AND MANNERS.

A COURSE OF BIBLE TEACHING FOR THE SCHOOL AND HOME.

BY J. EATON FRASER, HEADMASTER OF THE RANMOOR SCHOOL, SHEFFIELD (UNIVERSITY DEMONSTRATION SCHOOL), A LECTURER IN EDUCATION IN THE UNIVERSITY OF SHEFFIELD, AUTHOR OF "IN THE OPEN AIR," "IN THE GARDEN," ETC.

A Lad and His Mother.

THERE is amongst the ballads of Tennyson one of extraordinary power, entitled "Rizpah." It embodies a story of motherly devotion—a story of the eighteenth century, when a highway robbery was punished with death and the body of the robber left to swing in chains from a tree until the bones fell apart and dropped to the ground. In Tennyson's story the mother tells the tale. Her son, she says, had been led away by bad companions, who dared him to rob the mail. To show that he dare, he had done it—had taken one purse, and flung its contents among his fellows. He was caught and hanged for a thief on a high gibbet, where "all the ships of the world could stare at him" as they passed. His mother, however, still believed in him and loved him. She determined that he should be buried in consecrated ground; and so on wild, dark nights she stole out, guided by the creaking of the chains, to the gibbet. One by one she had gathered up his bones, and, kissing them, had stealthily buried them within the churchyard wall. Then she died with the sound of her son's call in her ears, as when she had heard it on wintry nights calling her to his chains.

Such is the devotion of a mother to her son! The world might abandon him, but her love withstood the shame, the pain, the terror of the night, the gruesomeness of decay.

Some such story as this was probably in the mind of Rudyard Kipling when he wrote "Mother o' Mine."

> "If I were hanged on the highest hill,
> Mother o' mine, O mother o' mine!
> I know whose love would follow me still,
> Mother o' mine, O mother o' mine!
>
> "If I were drowned in the deepest sea,
> Mother o' mine, O mother o' mine!
> I know whose love would come down to me,
> Mother o' mine, O mother o' mine!"

It is, however, easy to see whence Lord Tennyson got the title of his story. King David was persuaded to hand over seven sons of Saul to the Gibeonites. Two of these were the sons of Rizpah, the daughter of Aiah. The Gibeonites took the seven men and hanged them on a hill in the beginning of the barley harvest. But here is the story in the graphic simplicity of the Bible:—

> "But the king took the two sons of Rizpah the daughter of Aiah, whom she bare unto Saul, Armoni and Mephibosheth; and the five sons of Michal the daughter of Saul, whom she brought up for Adriel the son of Barzillai the Meholathite: and he delivered them into the hands of the Gibeonites, and they hanged them in the hill before the Lord: and they fell all seven together, and were put to death in the days of harvest, in the first days, in the beginning of barley harvest. And Rizpah the daughter of Aiah took sackcloth, and spread it for her upon the rock, from the beginning of harvest until water dropped upon them out of heaven, and suffered neither the birds of the air to rest on them by day, nor the beasts of the field by night. And it was told David what Rizpah the daughter of Aiah, the concubine of Saul, had done. And David went and took the bones of Saul and the bones of Jonathan his son from the men of

Jabesh-gilead, which had stolen them from the street of Bethshan, where the Philistines had hanged them, when the Philistines had slain Saul in Gilboa: and he brought up from thence the bones of Saul and the bones of Jonathan his son; and they gathered the bones of them that were hanged. And the bones of Saul and Jonathan his son buried they in the country of Benjamin in Zelah, in the sepulchre of Kish his father: and they performed all that the king commanded. And after that God was intreated for the land" (2 Sam. xxi. 8–14).

One can imagine the lonely vigil of the broken-hearted mother, and one does not wonder either that the pathos of it appealed even to David, or that a great English painter has made the scene the subject of a famous picture.

This instance of devotion and love is, however, more than paralleled by another Bible incident. This time the son had been hounded to a terrible death, to a death the most shameful as well as the most painful. Amid the howling of the mob, who now sneered and jeered around, He had been nailed to a cross in company of two thieves. His followers had all forsaken Him and fled; His early promise of greatness had failed; and now, "despised and rejected of men," He was dying like some vile and guilty criminal, pinned to a rough cross of wood. "Now there stood by the cross of Jesus His mother." Read the story, and try to imagine all that the scene means.

"Then delivered he Him therefore unto them to be crucified. And they took Jesus, and led Him away. And He bearing His cross went forth into a place called the place of a skull, which is called in the Hebrew Golgotha: where they crucified Him, and two other with Him, on either side one, and Jesus in the midst.... Then the soldiers, when they had crucified Jesus, took His garments, and made four parts, to every soldier a part; and also His coat: now the coat was without seam, woven from the top throughout. They said therefore among themselves, Let us not rend it, but cast lots for it, whose it shall be: that the scripture might be fulfilled, which saith, They parted My raiment among them, and for My vesture they did cast lots. These things therefore the soldiers did. Now there stood by the cross of Jesus His mother, and His mother's sister, Mary the wife of Cleophas, and Mary Magdalene. When Jesus therefore saw His mother, and the disciple standing by, whom He loved, He saith unto His mother, Woman, behold thy son! Then saith He to the disciple, Behold thy mother! And from that hour that disciple took her unto his own home" (John xix. 16–18 and 23–27).

But stories of the love and devotion of a mother are innumerable, and, indeed, there are but few who have not experienced it in some degree.

There is, however, another side to all this. Such love and devotion places great responsibilities upon those who receive it. Too often, alas, this side is ignored, and the mother's self-sacrifice and love are taken as a matter of course. Occasionally, indeed, a son comes to despise his mother, who has denied herself even necessaries that he may have a chance to get on.

"I knew a young man once," says a Canadian professor, "educated at one of our great universities, clever and brilliant to a degree, but eaten up with cynicism. And I knew that young man's mother; it was to her that he owed his educational advantages. She was not clever as the world counts cleverness, but no sweeter, saintlier soul ever breathed. Her face was a perpetual benediction. And I have heard that young university sprig, who was not worthy to unloose his mother's shoe-latchet, talk down to her, and patronise her with a but half-disguised contempt, until I could have struck the man."

Nothing could be more directly opposed to the teaching of the Bible than this, as we may see:—

1. "Honour thy father and thy mother: that thy days may be long upon the land which the Lord thy God giveth thee" (Exod. xx. 12).

2. Notice how sternly Jesus rebuked those who would allow a man to escape his obligations to his parents by a trick. He interprets the law of Moses to mean that a man must do all that is necessary and possible towards the maintenance of his parents, and denounces the evasion of this duty (Mark vii. 9–13).

Then, lastly, we may turn again to the story of the crucifixion, and note that not only was the mother true to the Son, but that the Son, in His extremity of pain, with the weight of the world's sin upon Him, His thoughts turned to His mother, and with loving thoughtfulness He committed her to the care of "that disciple whom Jesus loved." He might have been forgiven if at that black hour He had forgotten her, but neither pain nor shame prevented His filial love from showing itself.

Finally, let us remember that He who taught and acted like this will one day be the Judge of all men, and we must answer to Him for our dealings in this as in all directions. There is a passage in the Bible which says this:—

"The eye that mocketh his father, and despiseth to obey his mother, the ravens of the valley shall pick it out, and the young eagles shall eat it."

Certain it is that Old and New Testament alike teach that the affection of the mother should be repaid by equal affection and service by the child, and that the duty of honouring, loving, and cherishing parents is rated as one of the cardinal duties and virtues.

The Lilac Fairy Book. Edited by Andrew Lang. (*Longmans, Green, and Co.*)

The rainbow comes and goes, and lovely is the rose, and Mr. Andrew Lang has exhausted all the colours of the heavenly arch long ago. Now he turns to Nature's combinations of the prismatic hues and gives us *The Lilac Fairy Book*, which is as fragrant as the flower itself and as delicate—rather too delicate for Jock, as a matter of fact, though just the thing for Penelope. The style of the fairy feast is unaltered; the type is rather more open than in some of the immortal volumes; the pictures by Mr. Ford are as pure and dainty and as numerous as ever; and the sources of the stories are those perennial springs upon which Mr. Andrew Lang staked out a claim "donkeys' years ago," as Jock would say. When the benefactors of the human race stand at last "all in a row," with their hands behind their backs, I think that Mr. Andrew Lang will get one of the biggest sweeties of all. For it is better to please a child than to fight a battle or make a Budget.

A Modern Dictionary. (*Macmillan and Co., Limited.*)

Here is a cheap dictionary, handy in form, excellently printed, and complete enough for all ordinary purposes, which contains meanings of *aviation*, *wireless telegraphy*, *Teddy bear*, *chauffeur*, *aerodrome*, *tele-writer*, and other words which connote the delights of modern life. The volume also contains foreign words and phrases with English equivalents, as well as the meanings of some of the most commonly used groups of initial letters. We have applied severe tests to the book, and it emerges well from most of them. We can recommend it with confidence for school and home use.

Learning by Doing.

AN ACCOUNT OF A SPECIAL COURSE DESIGNED FOR SCOTTISH BOYS WHO WISH TO BECOME SKILLED TRADESMEN.

BY JOHN CUTHBERTSON, M.A., JOHN STREET HIGHER GRADE SCHOOL, BRIDGETON, GLASGOW.

IN the intermediate schools of Scotland the course of study includes English, mathematics, science, drawing, music, drill, and one or two foreign languages. In most schools the pupils have an option in the choice of the languages which they wish to study. Such an option does not appeal to a boy who has resolved to become a skilled tradesman. For some years in John Street Higher Grade School, Bridgeton, Glasgow, special provision has been made for such boys. They are encouraged to equip themselves for important positions in industrial life. The aim of the course of study is not the learning of any particular trade, but rather the combination of intellectual and manual training. It is a fact that the future life of the majority of boys will be closely connected with the practical side of the industries of the country.

These pupils pass the Qualifying Examination before entering upon this course of work, and between the ages of thirteen and sixteen receive instruction on the broad general principle of culture, and also training in practical handwork. For the common subjects—namely, English, mathematics, etc.—there is no separate classification from the other pupils, who are working for the Intermediate Certificate.

TIME-TABLE FOR ALL BOYS.

Subject.	1st Year.	2nd Year.	3rd Year.
English	8 hours	6½ hours	7 hours
Mathematics	8 „	6 „	6 „
Science	3 „	4 „	4 „
Drawing	2 „	2 „	2 „
Drill	1 „	1 „	1 „
Music	½ „	½ „	—
French	6 „	5 „	5 „
(Latin or German)	—	(5) „	(5) „
or			
Manual Instruction	1½ „	2 „	—
Mechanical Drawing	—	3 „	2 „
Practical Mechanics	—	—	3 „
	30 hours	30 hours	30 hours

From the above table it will be seen that all boys in the first year have the same course of study, and take manual instruction for 1½ hours per week. This subject is treated as a form of hand-and-eye training, in which the boys are taught to handle tools.

In the second and third years there is a threefold option—(1) Latin; (2) German; (3) mechanical drawing, manual instruction, practical mechanics.

The following notes will convey some idea of the scope of the work done in this course:—

I.—MANUAL INSTRUCTION.

FIRST YEAR (1½ hours per week.)—Most of the boys have had two years at this subject before commencing the higher-grade course: Fundamental work—drawing and benchwork; secondary work—lessons on the tools and woods used.

Drawing.—Every exercise and model in the course is drawn full size. Plans and elevations are employed, but sections are also shown when they add to the clearness of the drawing. Sometimes the object is represented by means of an isometric or pictorial view. Everything is done exactly as an engineer or an architect would do it, so that a boy taking this course is receiving what might be described as a very elementary form of engineering and architectural drawing.

Benchwork.—The class is shown how to do the various exercises and make the models by means of demonstration lessons. They afterwards make the latter, using the proper tools, and finishing with glass-paper.

SECOND YEAR (2 hours per week).—As in first year, the work consists chiefly of the essentials—drawing and benchwork.

The method of individual teaching is adopted in this year. When a boy is ready to begin a model, he gets a copy of it and is required to make his own drawing. The first drawings are made with ruler, T-square, and set-square; then freehand dimensioned sketches are made. Of the more advanced models freehand sketches with sizes inserted are made first and working drawings made from them. Sometimes the object is drawn pictorially, either freehand or with instruments.

In the benchwork no demonstration lessons are given, each boy being shown how to perform any new tool operation as the need arises.

II.—MECHANICAL DRAWING.

FIRST YEAR OF SUBJECT (Second Year of Higher-Grade Course).—Work comprises solid geometry and engineering drawing (3 hours per week).

Geometry.—A cardboard model of the co-ordinate planes is constructed. Models in wood or cardboard of cube, prisms, pyramids, cylinder, and cone are also made. A solid is placed by the teacher in its position relatively to the co-ordinate planes. Each pupil does the same with his own models. Looking down upon them, he sees what the *plan* is like. The plan is then drawn. Similarly, the solid is viewed from the front and the *elevation* obtained. If a second elevation is required, the point of view is changed from front to side, and the side or end elevation obtained. In the old method, in which only the teacher's model was employed, the different views were more or less abstractions to the scholars. The new method appeals to the physical eye, the old one to that of the mind. The latter method may have provided a better intellectual training, but the former method will certainly produce a more real understanding of the subject. Another advantage obtained by making the models in paper or cardboard is that the pupils are made familiar with the appearance of the surfaces of the solids when they are opened out flat—that is, their developments. Formerly, the construction of the developments of solids was left until the pupils were well on in the study of solid geometry; now it is studied concurrently with plans and elevations.

Engineering Drawing.—Dimensioned sketches are made

from the actual objects of study—bolt and nut, riveted joints, dynamo ring, foundation bolts, lathe carriers, brasses, etc.—and scale drawings are made from these sketches on sheets with the aid of drawing-board and T-square.

All the drawings are dimensioned and made to correspond to the drawings used in engineering workshops.

SECOND YEAR OF SUBJECT (2 hours per week).—Subjects as in first course (Third Year of Higher-Grade Course)—that is, solid geometry and engineering drawing.

Geometry.—The drawing of more difficult plans, elevations, and sections of solids. More difficult developments—for example, part of cut cylinder and cone and intersecting surfaces.

Engineering Drawing.—Dimensioned sketches are made from the actual object, and from the sketches working drawings are prepared. The objects drawn and sketched are taken from the following: eccentric, crank, flanged safety coupling, marine connecting-rod, brasses, cylinder cover, horizontal bearings, J-hangers, and stop-valves.

Each scholar is expected to ink in and colour one drawing, to make a tracing from another, and to take a print from it on photo-paper.

III.—MECHANICS.

THIRD YEAR OF HIGHER-GRADE COURSE (3 hours per week).—The course of work in this subject is entirely practical. Before the student can take up profitably the study of mechanics, he should have some knowledge of the elementary portions of practical geometry and practical mathematics. A close connection between theory and practice should be maintained. The student's notebook should contain a careful description of each experiment, with the observations made and the conclusions drawn. In practical mechanics, as in all other branches of practical science, the teacher may adopt either the method of "verification" or of "discovery." The pupil may receive the definition of a law, and then verify it experimentally; or he may perform the experiment first, and then deduce the law from his results. The latter method has been adopted when possible, as all science is taught in this school by the method of "learning by doing."

SCHEME OF WORK.

Measurement of Force.—Relation between two forces inclined to each other and the single force that can (1) replace them, (2) balance them; parallelogram, triangle, and polygon of forces.

Moment of a Force about an Axis.—Principle of moments.

Parallel Forces.—Centre of gravity.

Machines.—(1) The lever, (2) the inclined plane, (3) simple pulley, (4) systems of pulleys, (5) wheel and axle.

Friction.—Laws of friction.

Mechanical Advantage and Efficiency of Various Machines.—Work—rate of work, horse-power. Motion—rate of motion, velocity, change of velocity, acceleration, acceleration due to gravity, falling bodies. Simple pendulum experiments.

In reply to the argument that pupils are asked to specialise at too early an age, it may be contended that they only make a general decision for a trade in preference to a business or professional pursuit. The culture subjects—English, etc.—receive sufficient attention. While no particular trade is taught, there is a general connection between the school training and the future employment of the pupil. Care has been taken to arrange that the work is not beyond the capacity of boys who enter upon the three-years' course at the average age of thirteen and who finish it at the average age of sixteen. Pupils who complete the course satisfactorily will be able to begin their apprenticeship at once and to continue their studies in the technical college.

Much of the success of this work is due to the enthusiastic and efficient teaching of my colleague, Mr. James Lauder, who, it may be specially noted, received a practical training in a large engineering works.

FAR AND NEAR.

INTERESTING ITEMS DRAWN FROM VARIOUS SOURCES.

RUNNING AWAY.

THERE was a time when "running away to sea" was equivalent to a capital crime. We are changing all that, and our attitude towards the matter will soon be that of the husband who, on being told that his wife had run away, lazily asked, "Why run?" We take the following interesting paragraph from *Country Life*:—

> "From every point of view the movement for establishing centres for training boys to be sea scouts deserves to be supported. In the first place, it helps us out of a difficulty that has long been felt with regard to a certain type of boy. After he leaves school his parents send him to be an errand-boy at some large establishment. For his years he is very well paid for this kind of work; but it teaches him nothing, and leaves him with no career when he becomes too old for it. Just at the time when an apprentice of the old-fashioned sort would have been taking to journeyman's work, he is cast adrift to swell the ranks of unskilled labour.
>
> "Now, obviously, a very large proportion of these boys might be utilised for service in the navy and the mercantile marine. At the present time over 37,500 foreign seamen are employed in the English mercantile marine service, and the payment in wages to them comes to two millions annually. There are therefore abundant openings for those who are trained to the work.
>
> "The system of preparation adopted is excellent. Wherever there is a river there may be a brig, and there are already vessels of this kind at Cardiff, Oxford, Gloucester, Kingston, Norwich, and many other places. Here the sea scout is taught to load and unload a gun, instructed in the duties of an able-bodied seaman, and is in other respects trained for a seafaring life. Should he wish to adopt it afterwards, the influence of the promoters is used to find a berth for him either in the navy or in the mercantile marine. This is an excellent movement, and should have the very best results."

NOT TOO OLD AT FORTY.

A recent number of the ever-popular *Strand* contains a very interesting paper on the old man, protesting in a humorous way against the idea that this is especially the age of young men, and that old men must be laid upon the shelf. The writer asks who are doing the most and the best work—the men of sixty or the men of thirty? He inveighs against the idea of Professor Osler, that a man has done his work at sixty and is thereafter a negligible quantity. The writer refers to Mr. Robert Martin of Liverpool, the inventor of the gas-stove, now in his eighty-seventh year, but still hale and vigorous. Lord Strathcona may be said to have founded his imperial reputation at seventy-five; at ninety he is at his office daily at ten o'clock, and after

working diligently all day, attends on an average three public banquets or dinner-parties a week. William de Morgan was sixty-five before he thought of writing novels. Pierpont Morgan was sixty-five before he thought of his colossal scheme of finance. Mr. Chamberlain was sixty-five before he suggested tariff reform. Earl Roberts was nearly seventy when he went out to retrieve disaster in South Africa. Mr. Gladstone said that if he had died at seventy fully half of his life-work would have remained undone. Fifty years ago a man at thirty-five was supposed to be middle-aged, and at forty-five to be old. Now Mr. Lloyd-George is supposed to be a very young man, and he is forty-seven.

A New Form of Conscription.

The following bright idea emanates from the brain of Mr. William Jones, who writes in *M'Clure's Magazine*:—

> "If now there were, instead of military conscription, a conscription of the whole youthful population to form for a certain number of years a part of the army enlisted against *Nature*, numerous benefits to the commonwealth would follow. The military ideals of hardihood and discipline would be wrought into the growing fibre of the people; no one would remain blind, as the luxurious classes now are blind, to man's real relations to the globe he lives on, and to the permanently solid and hard foundations of his higher life. To coal and iron mines, to freight-trains, to fishing-fleets in December, to dish-washing, clothes-washing, and window-washing, to road-building and tunnel-making, to foundries and stokeholes, and to the frames of sky-scrapers, would our gilded youths be drafted off, according to their choice, to get the childishness knocked out of them, and to come back into society with healthier sympathies and soberer ideas. They would have paid their blood-tax, done their part in the immemorial human warfare against Nature; they would tread the earth more proudly; the women would value them more highly; they would be better fathers and teachers of the following generation.
>
> "Such a conscription, with the state of public opinion that would have required it, and the moral fruits it would bear, would preserve in the midst of a pacific civilisation the manly virtues which the military party is so afraid of seeing disappear in peace."

It seems to involve a great deal of trouble for the sake of the "gilded youth," who are hardly worth tarnishing. Most of us find our place in the fight against Nature without any very earnest seeking for it.

Santa Claus, Old Nick, Nickel.

"Few people," says the *Review of Reviews*, "would imagine that these very different names are all parts of the name of an estimable Bishop of Myra in the fourth century—St. Nicholas. Dr. Smythe Palmer, in the *Nineteenth Century*, explains the singular differentiation of these terms. He says:—

> "'The pretty legend which told how the good bishop stealthily flung a purse of gold through a window on three successive occasions, in order to provide a marriage portion for the three fair daughters of a poverty-stricken gentleman in his native city, was so widely current that parents in later times pretended that the little presents which they provided for their children at Christmas-time had been left by St. Nicholas (or Nicklas), who had popped in through the windows during the night. The perennial popularity of Santa Claus—that is, Klaus, 'Klas, the mutilated remnant of Nikolaus—as the unseen giver of Christmas gifts still keeps his memory green.'

"Pope Hildebrand said that with these gifts of St. Nicholas a rod was also given, to remind the children of punishment for transgressors. Gradually he became the bugbear of the nursery, and so he degenerated into a kind of hobgoblin. Allan Ramsay speaks of 'Auld Nicol.' In Sweden, in 1728, Kupfer-nicol, copper-demon, was a name for worthless ore which yielded no metal, whence comes our nickel, as a name for a well-known base metal, 'as if produced by the mocking imps of the mine.'"

This is a curious intermingling of various worlds, and one cannot help condemning as perverted ingenuity a spirit of research which ends in identifying Santa Claus with the author of all mischief. By the way, will any kind reader tell me how to deal with the following query of an eight-year-old:—

"Father, Fred says that Santa Claus is you. It isn't true, is it?"

The New Mind.

Mr. H. G. Wells writes in the *Forum*, and his subject is his present-day impression of Cambridge, the "hallowed seat" of the poets.

> "Always I renew my old feelings, a physical oppression, a sense of lowness and dampness almost exactly like the feeling of an underground room where paper moulders and leaves the wall, a feeling of ineradicable contagion in the Gothic buildings, in the narrow, ditch-like rivers, in those roads and roads of stuffy little villas. Those little villas have destroyed all the good of the old monastic system and none of its evil.....
>
> "Some of the most charming people in the world live in them, but their collective effect is below the quality of any individual among them. Cambridge is a world of subdued tones, of excessively subtle humours, of prim conduct and free thinking; it fears the parent, but it does not fear God; it offers amidst surroundings that vary between dinginess and antiquarian charm the inflammation of literature's purple draught; one hears there is a peculiar thin scandal in the world—a covetous scandal.
>
> "We have to make a new academic mind for modern needs, and the last thing to make it out of, I am convinced, is the old academic mind. One might as soon try to fake the old *Victory* at Portsmouth into a line-of-battle ship again. Besides which, the old academic mind, like those old bathless, damp Gothic colleges, is much too delightful in its peculiar and distinctive way to damage by futile patching."

The Strenuous Life.

That we are a degenerate race goes without saying. Old people are continually reminding us of the fact with a significance of which the meaning is obvious enough. And now a lady of the Roosevelt cabbage-patch rubs in the lesson in the *Atlantic Monthly*.

> "To-day a child's illness, an over-gay season, the loss of an investment, a family jar—these are accepted as sufficient cause for overstrained nerves and temporary retirement to a sanatorium. In other days, war, rapine, fire, sword, prolonged and mortal peril were considered as furnishing no excuse to men or women for altering the habits or slackening the energies of their daily existence.
>
> "Sir Ralph Verney, an exiled royalist, sent his young wife back to England to petition Parliament for the restoration of his sequestrated estates. Lady Verney's path was beset by dangers and difficulties. She had few friends and many enemies, little money and cruel cares. She paused in her labours long enough to bear her husband 'a lusty boy;' after which Sir Ralph writes that he fears she is neglecting her guitar, and urges her to practise some new music before she returns to the Continent.
>
> "Such pages of history make tonic reading for comfortable ladies who in their comfortable homes are bidden by their comfortable doctors to avoid the strain of anything and everything which makes the game of life worth living."

A Dog with a Bad Name.

The Scottish Education Department is jealous for Burns's reputation, and uses his little weaknesses as the text for an official sermon. We read in the last Report:—

"It was not pleasing to observe the constant stress that was laid on the vices of Burns. One candidate even, when alluding to his intemperance, was so carried away by the didactic impulse as to add, 'If it had not been for this sad habit, we might have had him with us yet.' It is difficult to believe that teachers are to blame for moralisings of this sort. In all probability it is due merely to the censoriousness of youth. But if any Scottish teacher is in the habit of making Burns the 'drunken helot' of a homily, he may be advised, in speaking of him to young pupils, to emphasise rather his struggle against temperament and circumstances, and, above all, the splendour of his poetic achievement. Surely no part of a poet's life is of such value to posterity as the part he has given to poetry, and time devoted to expatiating on Burns's shortcomings would be spent to greater advantage in reading a few more of his poems. 'Tam o' Shanter' and the 'Cottar's Saturday Night' were the only poems of Scottish life that were at all widely known."

Knowledge of the others will come later, when the candidate has done with "My Lords" and begins to live.

Mr. Chesterton on School Books.

Allowing for Mr. Chesterton's little way, there is a great deal of truth in the following passage:—

"We most of us suffer much from having learnt all our lessons in history from those little abridged history books in use in most public and private schools. These lessons are insufficient, especially when you don't learn them. The latter was indeed my own case; and the little history I know I have picked up since by rambling about in authentic books and countrysides. But the bald summaries of the small history books still master and, in many cases, mislead us.

"The root of the difficulty is this, that there are two quite distinct purposes of history—the superior purpose, which is its use for children; and the secondary or inferior purpose, which is its use for historians. The highest and noblest thing that history can be is a good story. Then it appeals to the heroic heart of all generations, the eternal infancy of mankind. Such a story as that of William Tell could literally be told of any epoch; no barbarian implements could be too rude, no scientific instruments could be too elaborate, for the pride and terror of the tale. It might be told of the first flint-headed arrow or the last model machine gun. The point of it is the same: it is as eternal as tyranny and fatherhood.

"Now wherever there is this function of the fine story in history, we tell it to children only because it is a fine story. David and the cup of water, Regulus and the *atque sciebat*, Jeanne d'Arc kissing the cross of spear-wood, or Nelson shot with all his stars—these stir in every child the ancient heart of his race; and that is all that they need do.

"Changes of costume and local colour are nothing. It did not matter that in the illustrated Bibles of our youth David was dressed rather like Regulus, in a Roman cuirass and sandals, any more than it mattered that in the illuminated Bibles of the Middle Ages he was dressed rather like Jeanne d'Arc, in a hood or a visored helmet. It will not matter to future ages if the pictures represent Jeanne d'Arc cremated in an asbestos stove or Nelson dying in a top hat. For the childish and eternal use of history, the history will still be heroic."

After this we can go ahead with our lesson on the tale of Alfred and the cakes, which is surely true to life if not true in fact. Besides, it could never have been told of a king who lacked a sense of humour.

A Word to the Wise.

Here is a hint for animal lovers which seemed to me to be worth passing round. It is taken from *The Animals' Friend*, which is published by Messrs. George Bell and Sons, and which ought to find a place in every school.

"It is a mistaken idea that the proper way to lift a full-grown cat is by the nape of its neck without supporting the lower part of his body with the other hand. It is true that the mother cat carries young kittens by grasping in her mouth the loose skin at the back of her offspring's neck, but a tiny kitten is a very different matter from a large cat, and, indeed, the only way to lift a kitten without squeezing or hurting its soft little body is to lift it by its neck. But after it has grown larger its own weight is too great to be supported by such a bit of skin and fur as is so grasped by the hand; and many a cat suffers perfect tortures by being held in this manner, and is quite helpless to run or struggle, as in such a position certain of its muscles cannot be controlled, and it is absolutely at the mercy of its unconscious tormentor.

"The same rule should be observed in lifting rabbits by their ears. They should always be partially supported by the free hand, and not allowed to dangle with their whole weight straining from their sensitive and delicate ears."

The *August* issue of *The Animals' Friend* contained an excellent article on the cruelty of keeping birds in cages, which has been reprinted as a leaflet, and can be had on application (price 1s. for 50, post free) to the publishers at York House, London.

Tawdry.

The following note on derivation will interest many people of our jerry-built age. It affords a good instance of that fall in estimation which so many of our commonest words have experienced.

"On the banner of the Church Congress which recently sat at Cambridge is figured the portrait of Saint Etheldreda, the virgin queen of the Saxons, over whose shrine the cathedral of Ely was built. Her local, homely name is Saint Audrey; and Audrey, as readers of Shakespeare need not be told, was at one time a common feminine name in rural England. Saint Audrey's fair used to be held in the Isle of Ely, and here there used to be sold a kind of rustic necklace which came to be known as the 'Tawdry laces.' Probably they were made cheap and poor in order to bring profit to those who sold them, and hence the origin of the adjective 'tawdry.' Such is the story, and it induces us to turn up the phrase 'Tawdry lace' in *The Oxford Dictionary*, where it is defined as follows: 'In the earliest quotation St. Audrey's lace—that is, lace of St. Audrey, or Etheldreda (daughter of Anna, King of East Anglia, and patron saint of Ely): A silk "lace" or necktie, much worn by women in the sixteenth and early seventeenth centuries; sometimes taken as a type of female adornments'" (*Country Life*).

There is a sting in the last phrase of this definition which may or may not be intended.

A Good Story.

In his address at the National Liberal Club, Mr. Booker Washington said a negro theologian was once explaining why the children of Israel crossed the Red Sea in safety, and why the Egyptians were drowned.

"You see," he said, "it was the middle ob winter, and the children ob Israel crossed in the mornin', when the ice was nice and hard. But the Egyptians crossed at twelve o'clock, when the sun had been shinin', and melted the ice and they was drowned."

"That can't be true," said a young coloured student, "for I've learnt from my geography that ice won't freeze so near the equator."

"Just what I expected," retorted the preacher. "There's always some of these larned young men to spile our theology. But I'd hev you to know that them times I'm talkin' about was before there was jographies and 'quators."

NEXT MONTH.

Reviews of Gift Books, handsomely presented, but not in such profusion as to crowd out the usual useful features.

Modern Psychology and the New Methods in Education.

BY W. H. WINCH, M.A. (CANTAB.),

Honorary Treasurer of the British Psychological Society; Member of the British Association Committee on Mental Measurements; Chairman of the Committee of the Teachers' Guild of Great Britain and Ireland on Psychological Research in Schools.

VI.—Activity and Thought—Thought is for Activity.

PERHAPS the most remarkable difference between modern psychology and that which was open to most of my readers in their student days is the present insistence on the motor side of mental life—an aspect to which early psychology gave little attention. This insistence is having—nay, it has already had—an enormous influence on educational theory, and it is beginning to have influence on educational practice. Even philosophy, which to young students seems so far aloof from mundane affairs, has been affected. A school of thinkers, of whom Professor William James (whose recent death was actually commented on in the daily newspaper) was the most distinguished exponent in America, and of whom Dr. F. C. S. Schiller of Oxford holds the leadership in England, have indeed boldly advanced the view that our intellect must not be regarded primarily as a thing aiming at self-satisfaction, but as existing and developing because we *had* to use it to satisfy our wants. It was in action that we learnt to think; it was in action that the race progressed from savagery to civilisation; it is in action that we, too, must be trained to think. There are many problems of philosophy, say these thinkers, which we need not worry over. Their solution is not important; in fact, they have no real solution at all, for the action of no human being would be influenced either one way or the other, whether those questions were decided in the positive or negative. The test is always action. It is always asked, What are the consequences of a particular belief? Does it work?

I do not propose to enter into these difficult questions of philosophy here. Though I wholly, or almost wholly, subscribe to the view that knowledge should issue in practice, yet the brooding thinker, with no immediate practice in view, must not be regarded as necessarily useless to mankind; and there may be children—a very few, perhaps, but still some—even in elementary schools who show quite early that they are likely to love thought and knowledge for their own sakes.

But for the great bulk of us and for the great bulk of our children it is incontestably true that intellect is for action, that we think that we may act, and often that we only think because we needs must act and cannot do it without thinking.

Let us not, however, run into exaggerations. Because we think in order to act, it is not the same thing to say that every time we act we have thought or are thinking. We may not look before we leap: that we most assuredly ought to do; but we need not examine the ground with a microscope. If we do not look before we leap, we may have an opportunity for thinking afterwards. On the other hand, we may not. If we examine the ground microscopically, it will be some years before we make our leap at all; and though "better late than never," it is better still to be in time.

There are quite well-instructed writers who tell us that the mind is essentially a reflex arc, and that the mental series is always sensation and motor reaction. That we have developed from a condition in which that was fatally true every evolutionist must hold; and we see some such condition to-day in the moth, which inevitably reacts to a flame by flying in it. We are not moths, I know, but we can blunder into action just as stupidly at times. On the other hand, it is said that a person who *never* makes mistakes never makes anything.

Where is the truth for us educationists which emerges from all this? I have taken no extreme view, I hope, and intend to take none; and I should draw some such conclusions as the following:—

We must definitely give up the notion that children can with any advantage be treated as mere receptacles for knowledge. (I do *not* mean that children should never *learn* anything.) Without acting upon his knowledge, without making more of it—putting, as we say, two and two together—without expressing it, the learner was supposed to carry his learning until, some day by-and-by, it could all come into action together. There you had him, the scholar and the gentleman; not fit for anything in particular, it is true, but really fit for everything, because, according to notions then prevalent, he was an educated man.

A little while ago it was not uncommon to hear educationists speak even more decidedly. If a child were asked to reproduce or to use his knowledge, they called it pulling up a plant by the roots to see how it was growing. Even an occasional test in which he was required to work without help was regarded as an interference with the silent processes of mental digestion, which, it was thought, went on better without conscious activity, just as we are said to digest our bodily food better if we do not run about after eating. When I was in Germany, I was repeatedly struck with the unwillingness of the teachers, especially in the elementary schools, to encourage, or even to permit, their pupils to tackle things for and by themselves. In one class in a higher primary school a very able teacher, who asked his pupils to work by themselves an exercise for me in French, was met with friendly expostulations.

"What, here, sir?" the boys said. Surely that was teaching-time, they thought; the sort of work I wanted ought to be done at home. And in the elementary schools generally, to set a sum for the children to work, and expect them to do it individually without help from each other or their teachers, was to subject myself to difficulties and disappointments. The German teaching was admirable; the lessons were often of finished beauty, like a work of art; but the conative impulse of the pupil was very rarely there. He had too much done for him.

In striking contrast with this is the method of teaching in the schools of America. Educational reformers there are pointing out the need for *some* oral lessons which shall be expository, and not merely a working over of what has been already learnt, or supposed to have been already learnt.

Where are we in all this? Are we more like the German or the American in our methods? I fear we are much more like the German, and have in recent years become more and more so. We have judged schools by listening to the teachers; and our training colleges are far too prone to train students to give lessons, not to teach, so what could we expect otherwise?

But there is a change imminent; its need is felt, and here and there it is in progress. As the Board of Education Code points out (it is the last, I think, but there are so many), the absence of annual examinations was not intended to imply the decay of effort or activity on the part of the pupils; it was intended to have quite a contrary effect.

I hope to deal in more detail with motor activities subsequently. To-day I have tried to show generally that the active side, the doing or expressing side of mental life which the latest methods favour, is an outcome of a wide-reaching change of opinion and knowledge, which affected psychology and philosophy, and then moved onward to affect educational theory.

(*To be continued.*)

The Organisation of Juvenile Employment.

BY JOHN PERKINS.

THE DEMANDS OF THE PRINTING TRADE.

(*Continued from page 236.*)

IN common with many teachers up and down the country I have been considerably exercised in mind concerning the placing of my boys in suitable employment. Four years ago I opened a new school in an extra-metropolitan district, but the problem did not concern us greatly until the last year or so. Now we expect to have from fifty to sixty boys passing out into the world every year.

With very few substantial industries in our immediate neighbourhood, it is necessary for most of our boys to look to London for work; and the difficulty experienced in fitting a boy satisfactorily into the *right* job led me to endeavour to get into touch with employers, in order to ascertain what opportunities of employment they could offer, the kind of boy they required, and what hope there was for advancement in their particular industry.

My original intention was simply to glean such information as might be useful to my own scholars; but the editor has asked me to widen the scope of my inquiries, and to furnish details for the benefit of the readers of the *Practical Teacher*.

I ought to say at the outset that all whom I have interviewed, or to whom I have written, have been most ready and most courteous in their desire to help me; so that, if my experience is any criterion, any reader who would wish to institute a similar inquiry need fear no rebuffs from those in responsible charge.

In the course of my investigations I have naturally come into touch with a great diversity of callings, but for the purpose of these papers I propose to group those which are akin.

Up to the present time I have studied more particularly the opportunities offered by the printing trade. So far as my experience has taught me, I feel that there is probably no vocation for which the general education given in an elementary school is more fitting. Moreover, there is no doubt that printing is a growing industry, offering scope not only for ordinary journeymen, but for ambitious young fellows with taste for design and colour, for whom there is a great demand in works where display and colour printing are executed.

It has constantly been thrown in my teeth by folk in the printing trade that

THE ELEMENTARY SCHOOLBOY IS INCAPABLE,

and he and his genus have been anathematised over and over again in language more forcible than polite. It is so easy to argue in general terms, and, good fortune having enabled me to visit one of the largest printing works in London, I determined to ascertain the truth and to obtain suggestions for improvement. But let me give the opinion of one who has had many years' experience in all branches of the trade, and is now in charge of the reading (proof-correcting) department at these works. He has been good enough to put his views into writing, and I quote *in extenso*:—

"Generally, my opinion is that, not only for the printing trade, but also for other occupations, the course of study should be confined during the earlier years to grounding children in the three R's and in cultivating their powers of observation. The later years at school might be devoted to special training which would fit different groups of children for the different occupations for which they are designed. The ability to read well, and with understanding, would assist them in extending their knowledge by means of books with the least assistance from their teachers.

"Boys generally come into the reading room for a year or two before being apprenticed to one or other branch of the printing trade—most often to the 'composing;' but sometimes boys go from the reading room

into the foundry (stereotyping, etc.) or to the machine room. In large London offices lads do not learn the whole 'art and mystery' of printing, but only portions —that is, departments. The difficulty nowadays is to secure lads just from school who are able to read even plain printed copy; and their understanding of what they read, by those who can get along fairly well, is sometimes very limited.

"THEY WANT TO BE TAUGHT TO THINK,

and to think quickly, and I know of no better training to secure that result than the old-fashioned 'mental arithmetic,' which certainly had the effect of brightening up the most dull. Another thing which would also be useful would be a sort of missing word competition—making the lads supply suitable words to complete sentences purposely left unfinished. Such training would help them to decipher bad manuscripts, and would not only serve them in good stead when they are reading boys, but afterwards in the composing room, and eventually should they become 'lino.' operators.

Memory training is also needed, as well as a knowledge of grammar and punctuation, especially if the lad designs after his apprenticeship to return to the 'reading closet' as a reader.

"Lads intended for the composing or reading branches of the printing trade cannot read too much, and should be encouraged to improve their general knowledge by delving among books and papers of all kinds. If I were asked whether I should recommend a study of foreign languages, I should say that a slight knowledge of the grammar of such and of the formation of foreign words is of great use; but the thing to aim for is a *thorough* knowledge of English first. Of course if a lad wants to specialise, he might try to become proficient in one or more ancient or modern tongues; but such specialists are required only in a comparatively limited number of houses.

"What is wanted at first is a good knowledge of English, the power to think, capacity for work, plenty of energy and application, and a fund of common sense. All these are wanted by the compositor and the 'lino.' operator; but some of the qualities are more urgently needed in the reader. Of course some of the attainments mentioned could not be reached in ordinary schooldays, but would have to be acquired by means of evening schools while learning the practical portion of the trade.

"I am of opinion that it is a mistake to attempt to impart technical instruction in schools (elementary?) which should confine their efforts to preparing the receptive faculties of the children, so that they can pick up easily and readily a practical knowledge of the trade they wish to follow in the ordinary course of apprenticeship. I have known cases of men who have been

"GOLD MEDALLISTS AND WHAT NOT AT TECHNICAL INSTITUTES WHO APPEARED VERITABLE DUFFERS

when set to work in the ordinary printing office. Given the desire to get on in his trade, and with the mental abilities properly directed in schooldays, a boy to-day can learn the section of the trade to which he is apprenticed as easily as ever he could."

Such inquiry as I have been able to make has been by no means exhaustive; but I believe I can claim to have obtained very representative opinions, and such go to confirm the views which I quote. There is a very general feeling—so far as London is concerned, at any rate—that the boys are leaving school seriously deficient in the three R's.

Let us deal for a moment with the typical firm I have mentioned. The work executed is of a very varied character, embracing the printing and binding of many important papers and magazines, general jobbing and commercial work, and art and colour printing. The actual number of employees in the various departments will give some idea of the scope of the business. In the composing rooms there were 86 men, 18 apprentices, and 9 lads engaged in hand-composition, with 25 linotype operators; in the reading department there were 13 readers, 4 copyholders, and 7 reading boys; in the machine rooms, 50 minders, 60 assistants and labourers, 8 apprentices, and 14 lads; in the foundry, 12 men, 2 apprentices, and 1 lad; in the warehouse, 54 men, 3 apprentices, and 2 lads, besides 60 women and girls and 5 learners, who were employed in folding and stitching. In addition there were the managers and overseers of the works and its departments, with their deputies, as well as the counting-house staff. In all there was a staff of over 300 men, 31 apprentices, 33 lads not apprenticed, besides women and girls and the managing staff.

In this firm, as is common in the printing trade, the usual term of apprenticeship is for seven years, commencing at fourteen to fifteen years of age, and the wages run from 6s. per week in the first year to 22s. 6d. in the seventh. The method of selection is, more or less, one of haphazard; but, as a rule, the boys have been recommended for employment by interested parties, and there are always a number on the list awaiting a vacancy. Generally the boys graduate in the reading department, and, if they prove fitting, are drafted to other branches and indentured.

Time was when printing was looked upon as the cream of the trades, and the remuneration offered compares very favourably with others which demand high skill and good education. As a rule, wages here ruled higher than the general union rates. Compositors, working 52½ hours per week, can earn from 39s. to 45s.; linotype operators get 45s. to 63s. for 48 hours; readers, 44s. to 56s. for 51 hours; machine-minders, 44s. to 52s. for 52½ hours; and foundry mechanics, 40s. to 55s. Overtime is paid for at considerably higher rates. The pay, then, seems to offer inducement to an intelligent lad, especially when we consider that superior positions are open to the most competent and trustworthy.

(To be continued.)

A PROSE POEM.

THE Rev. D. Gibb Mitchell, Cramond, recently delivered a sermon in "braid Scots" before a large and attentive congregation in St. Cuthbert's United Free Church, Edinburgh. His subject was "The Wumman at the Waal Heid." In his prayer Mr. Mitchell said:—"God abune, will us into the silence o' yir presence, gaither us a' roun' yirsel', an' thole and quate us. We've been oot i' the storm, we've been tossed aboot; there's been nae restin'. Oor cares an' needs hae dung us like flails, an' we're tired, and sick, and weary. We rin oot frae it a' that we may win doon at yir feet and hear yir voice. It's eneuch to be near yirsel'; there's scarce needs fir words; we wud fain say naething an' jist bide quate wi' yir haun' upon us. Oor days are mony and fu' o' change, there's no twa' alike; whiles it's a season o' wark, ilka muscle pu'in' an' strainin', whiles it's a time o' sickness an' pain; oor bed's oor warl'; we're set aside oot o' the way.....Ye ken oor laneliness an' days o' tears, ye ken a' oor foolish thochts an' deeds. Lichten oor soul wi' yir Word an' Spirit, clear aff the past, an' stan' by us as we falter on ilka day. Lat oor wills be fairly set, oor conscience speak wi' a clear voice. God maun win the day! His leal folk will gaither frae the east, the west, the north, an' the south when the warsle o' life is owre."

AN INTERESTING EXPERIMENT: A HOLIDAY SCHOOL IN TOWN.

YESTERDAY I was on the East Coast. The sun was blazing in a cloudless sky. The sea, deep blue as a sapphire, shivered into a thousand little waves under the warm breeze, and everywhere the brightest diamond points glittered as the sun caught the ripples. Nearer the shore, where the shallows are, the colour was changed into purple, while a bright band, greener than an emerald, shot like a path across the sea.

Along the edge of the beach the waves broke into a dazzling foam, which flecked the water as it ran back over the shallows. On the shore, daintily dressed children ran after the waves as they receded; others, digging into the sand—which, under the sun, glowed like old gold—added to the liveliness of the scene. There, where I lay on the cliff, the pleasant sounds intermingled—the wind, the wash of the water, the wailing call of the gulls, and the children's cries. The cliffs themselves were ankle deep in wild-flowers—wild purple thyme in thick patches, and widespread lady's bedstraw—whose dainty scent was carried along on an invisible breath. The scene was perfect; one had only to lie among the flowers and let the eye wander over sea, sky, and shore in mere enjoyment, the senses soothed and the mind at rest.

To-day I am back in the great City. I have walked down an ancient street, from which, on the right and left hand, narrow, fetid courts give off like dead branches from a dead tree. The doors stand open, and on the steps women sit to breathe the air—a little sweeter than the acid and stagnant air that catches the throat as you pass the houses. Listless men lounge about the streets or pass in and out the "publics," which never fail of their tale of customers. And the children? Everywhere—on the pavements, in the roadway and in the gutters, crowded in the narrow alleys—dirty and unkempt, they cluster, their little shrill trebles piercing the thick air. I think of yesterday—the sweetness, brightness, health, and light, the dainty children and proud parents. This mean street disappears for a moment; but in a flash it strikes the senses again with all its crude, cruel circumstance, and the shock hits the mind like a blow.

I pass slowly down the long street. The houses seem to crowd together to shut me in from all sweet sounds and scents. The picture of yesterday seems to be struggling to show itself, but the mere thought of the open sea is oppressive in these narrow confines. It puzzles the will and clogs the steps; a bad witchery has changed a sweet world into a noisome path from which there is no escape. This is a new thing to me, yet the street is familiar enough. Day after day I pass hours in such surroundings; but never before, never till to-day, upon a sudden transition from the perfection of summer to this spot (never meant for women and children so much as to see), have I felt despair. What hope is there for the children, the coming citizens of the monstrous city? How shall they escape?

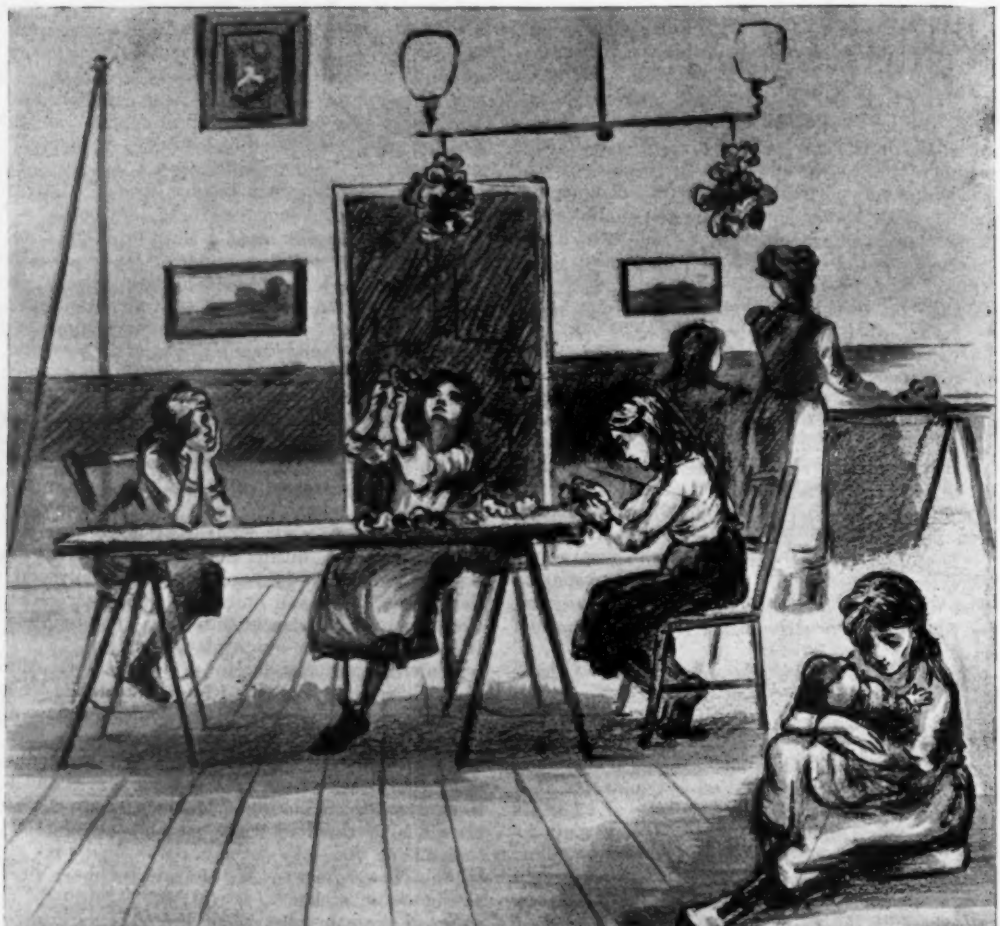
At this moment I reach a school with spacious playgrounds, spreading where once vile courts and alleys clustered together in sad companionship. At least the light has been let in, and the air can stir in these broad spaces. Sounds of happy laughter come from the playground bounded by this high wall. There are cries of excitement following the sharp crack of a bat striking a ball, for the royal game of cricket is in full swing. Come into the playground and watch these champions. Nature is very kind: she at least leaves the capacity for fun to these poor children, who have so little of this world's goods and golden opportunities. Others are racing after one another with great glee; and there, in a quiet corner (rub your eyes, and look again), is a happy group *digging sand!* Alas, to-day and yesterday! *There*, a never-ending beach, with the glorious sea beyond; *here*, a heap of damp sand, hard by a brick wall. Yet how does "fancy piece out imperfections" in human life! No daintily-kept children by the sea are happier than these frail little waifs building their castles (which they show with immense pride) or turning out "puddings" from their tin pails.

Ask that young man who is entering with such zest into the children's play what is the meaning of all this, and he will tell you that while the County Holiday Fund sends thousands of happy children to the fields or the sea, there are yet many children in such utter poverty that they cannot be taken away from their homes for a fortnight. For these children, in this poverty-stricken district, the County Council has opened the school during the holidays, in order that the boys and girls may be happily and healthily employed. Teachers are engaged, and the children are gathered in from the terrible streets into a palatial building with wide halls and clean-swept playgrounds.

Come upstairs with me for a few minutes. Here is a class engaged in modelling leaves in clay; others are painting. A sound of singing comes from a distant room. Soon they will take their turn in the playground, when the elder cricketers and the builders in sand are resting, or are busy cutting shapes and models in cardboard. Sometimes you shall see them seated on the floor in the hall while pictures are flashed on a screen; or you may meet a party ready for a jaunt to the Tower, or to Westminster Abbey, or (more glorious still, and a rare treat) for a ride to a distant park. For even grass is accounted a rare growth in these parts. You shall see the children thrusting their little arms through the railings around a grim old churchyard to pluck a few blades within reach; and a flower is a treasured possession. I have spoken to the girls who came to this holiday school. What did they like most of all? And the reply came as one voice, "Making paper flowers."

And very prettily they were made and clustered into bunches, which were hung from the gas-pipes to greet the children on their return to school. For they are happy in working for others: they delighted in dressing cheap dolls for the babies in the infants' school. The infants? Yes, there were more than a hundred little mites in the school below. It was a joy to see them playing "musical chairs." They danced and sang with rare delight. They also had their sand-pit, in which they were gloriously involved. Babies abound in our neighbourhood; you find them at every corner. They invaded even the holiday school; for many of the girls must needs bring them, or be denied the pleasure of the school—masterful babies, too, demanding unbounded service from their subjects!

Space forbids me to write at greater length. I can only mention the games and the drill for the boys; the dancing for the girls (there was a hornpipe which for vigour and grace would be hard to beat); the play-acting; nature study, painting, bead-work, and fancy



needlework; stories, class-singing, and swimming. Best of all, the children were allowed to be free; they entered at once into the spirit of the time, and passed from the playground to the classroom without a murmur.

Of course this experiment costs money. One would like to see the children taken now and then into the country, especially as there is no park near this wilderness of bricks and mortar; but the children, accustomed all their lives to expect nothing, would never dream of thinking themselves hard used. On the contrary, there was plenty of evidence that the mere congregating for play and pleasant employment was a joy to them. It was the visitors who wished for a Fortunatus purse to take the children and place them, at a word, down by the sea. *That* indeed would be a sight for the gods.

AN APPEAL TO OUR READERS.

PLEASE show this number of the *Practical Teacher* to a colleague who is not yet numbered among our subscribers. The larger the number of our readers, the more attractive we can make the magazine.

Twenty-six Poultry Types: an Alphabet of Fancy Folk. By "J. N. K." (*William Rice. 6d. net.*)

This is a collection of rather clever sonnets humorously descriptive of the various folk who are engaged in the poultry industry. The gentleman who writes the introduction states that "at my suggestion a few advertisements have been added, which will afford a desirable relief after the poems." At first sight we felt grateful for this suggestion, and thought the advertisements too few; but with closer attention we came to the conclusion that the weaknesses and frailties of the fraternity were very aptly put into verse. Perhaps the most striking are "The Novice," who

> "Is fashioned much as most of us may be;"

"The Pupil," in which we are reminded that

> "In these hard times the chance should not be lost
> Of having fowls looked after free of cost;"

and the "Lines on a Favourite Hen." If the author wishes to describe yet another type, may we suggest "The Sussex Higgler."

Handwork in Rural Schools.

BY W. FRANCIS RANKINE.

The Last Decade.

DURING the last decade the great possibilities of handwork have been gradually revealed to educationists, with the natural result that to-day the manual training movement has developed to such an extent that it is changing the facies of our curricula. And more than this—since, after all is said, a change of facies is not in itself a good sign—it promises to consolidate more firmly than any previous movement the policy of our system of national education. That this is good will not be denied by any one; that it fulfils many of our ideals must be apparent to all. Apart from the many educational advantages, both mental and physical, which accrue to the child in following its courses, the handwork subject at once places our teaching upon practical lines, and this new tendency of our system is one of the healthiest symptoms of the time. Undoubtedly we are at last upon the royal road to educational success; and, with an eye to the stringent suppression of any faddy extravagance, an equilibrium of method should be maintained, to the end that we shall eventually boast an educational system of value to the country. Many critics of old have mourned, and often, let it be said, with righteous cause, that our system lacked symmetry, stability, and perspective. They have charged us that frequently our paths have led us, and the child as well, into blind alleys, and that our teaching was not directed in the light of national utility. There is much of truth in these reviews; but the fault has lain at the doors of the system-makers. We as teachers did not fashion the system; we worked our pattern to the design submitted. We guided our charges faithfully through the alleys; we did not know they were blind alleys until we reached the barrier. Yet here at last, in this handwork movement, is the practical policy—the introduction of handwork as a prime essential in the development of the child.

Rural Requirements.

In the rural school the need of handwork training is much greater than it is in the town. On the other hand, the facilities for its working are much less. Here at once arises the prime difficulty—an obstacle easily appreciated, but, alas, not easily removed. From all points of view—and in the country we have many—handwork training is eminently suitable to the rural curriculum; yet in the majority of schools the lack of accommodation, the cost of equipment, and the weakness of the staff preclude, for all time apparently, the introduction of its teaching. On the drawbacks which confront the rural teacher, and the limitations of his horizon, I have remarked strongly before; yet in the consideration of the lamentable restrictions of the possibilities of handwork in rural schools one wonders profoundly and long when the adjustment of the backwood schools may be made. At present the future of the child is in jeopardy; his chances are at stake. Fortunate indeed are those comparatively few schools where the handwork training and construction work have been made possible. Thus it is that one cannot discuss this subject purely as an actuality, and one is driven in consequence to consider counsels of perfection.

The Rural Policy.

The discussion of our present rural educational policy has occasioned much literature, and in every contribution which one reads there is the unmistakably strong note of deprecation that our system is not in tune with our needs. If a man picks up a pen on the subject of the country child's schooling, he will inevitably inform you that the training is of little use to the child, and consequently of little use to the country. It is too true, and the matter touches upon one of those problems of delicate intricacy which demand a serious conference of competent opinion before any reconstruction should be instituted. One school of theorists recommend ultra-agricultural teaching, and promptly the suggestion is whole-heartedly condemned by its opponents. Thus arises a lengthened pen war of the theorists and no advance for the country schools. The whole business for a time seems beyond salvation, and after all it is mainly due to the fact that the majority of the people interested have faith in the delusion that it is possible to stay rural decay by means of our rural teaching. This is a hopeless faith, since rural decay is a natural consequence of numerous causes, both social and political; it is a phase of national development. Agricultural greatness can never again be a reality; we can never hope to bring our acres again under the influence of the plough by injecting our system with a rural stimulant. But we can, I think, do much to secure agricultural interests, such as they now exist, in a form less virile than fifty years ago, by adapting the training of the country child so that he is fully equipped to take a useful place in the noblest and really most important of the industries. And this aim may be more fully secured by the judicious mingling of handwork subjects in the rural curriculum.

Handwork in Agriculture.

Handwork is natural to the country lad; it is the pride of his ancestry. Older countrymen will have you know that it is gradually losing its force, and that the younger men are not over-zealous in the pursuit of manual office. The assertion is verified by numerous symptoms, since modern conditions of life make it possible for the sharper youth to turn his back upon the handicrafts of the soil. Great credit be to him. Modern progress also brings more opportunities for recreation within the grasp of the youth of to-day than came to their parents. There are also a multiplicity of callings which involve headwork, so that mere handwork has lost much of its nobility and honesty in the eyes of youth. Thus it is necessary that the country boy, in company with his town brother, should receive definite instruction in handwork, so that his abilities may be wisely directed. Such training becomes of the highest importance in a country school, since the teaching given in it is far-reaching in influence, because the majority of its children settle around it.

The whole argument is evident in the following paragraph, which is taken from the Board's "Suggestions on Rural Education" (page 5):—

"Rural industry is all more or less manual; and if children are to acquire handiness—the habit of manual

work, and that carefulness and attention to detail upon which success in rural industry often depends—manual instruction needs to be introduced into their early training. It has often been urged that if the use of the hands is not cultivated during school life beyond pen, pencil, and brush, there seems to be a disinclination for manual work after leaving school, and clerical work in the town seems more attractive than rural employment. As was the case with 'observation,' we need to introduce into children's schooling manual work which may go some way to replace the influence of the daily duties which school attendance precludes."

Practice *v.* Theory.

There are many keen rural teachers who survey with deep regret the wide gulf of impracticability which keeps the counsel of the "Suggestions" out of their reach; yet without doubt the following excerpt, which is marked with a keen appreciation of our difficulties, should give them hope: "The chief difficulty in the way of introducing woodwork in small schools is the cost of equipment, but it should be remembered that *the less elaborate the equipment at school the more likely is the boy to be able to utilise his knowledge afterwards*. A small workshop containing a single carpenter's bench, where three or four boys can work at a time while the rest are doing their drawing in school, might serve where better equipment cannot be provided." This is a suggestion which to me is peculiarly refreshing, for at once it lifts the subject into the realms of the highest utility, and snaps the chains of conventional procedure. It gives freedom of movement, and consequently widens the possibilities of handwork in rural schools.

Decadence of Rural Industries.

Freedom of treatment in handwork teaching opens up possibilities by which our rural industries may be greatly helped; it also allows of localisation according to immediate environment. That our rural industries are gradually sinking into decay is well known to all whose interest is claimed in the slightest by the country. Hedge-making, fencing, thatching, hurdle-making, and net-making are among the crafts which are quickly disappearing from the farm. Where you find them practised the exponents are inevitably old men. In many villages it is difficult to find a good thatcher, and the hurdle-maker in many districts is not known; peripatetic knights of the latter craft supply the farmer with their produce. This state of affairs, which apparently will grow worse with time, seems to be due to the fact that the younger generation have no opportunity of learning these trades: the old apprenticeship is lost. The hurdlers, the thatchers, the hedgers and fencers of to-day gained their skill in companionship with their fathers; there were no schools in those days to prevent them training for a livelihood. This fact—and solid fact it is—reflects ironically upon our teaching of the last three decades. In those old days they had a serious handwork training of an impromptu but effective kind. Why cannot we bring it back in a perfected form to-day? Handwork teaching opens up a new vista, and a pleasant one withal, and there is not the slightest reason why it should not be made to do something to revive the intelligence and the usefulness which were the character of the old-time men. And it is obviously true that if this teaching would improve the crafts we have mentioned, it would certainly make for the education of the child—namely, to equip the child for its work in life.

It is particularly necessary that we entertain no faddism in such serious work as this, and thus it follows that we must needs proceed cautiously upon the road. The interests of the child are paramount, and they are identified with the prospects of his post-school life; in the majority of cases he must go into the fields and rely upon the dexterity of his hands for his daily bread. His after-days are to be spent in one long stretch of handwork, often skilled handwork, and therefore why not breathe the spirit of intelligence into his manual practice while he is under the wholesome discipline of the schoolroom? From the commencement of his earliest experience within the village school walls it is possible to work to this end. Clay-modelling, stick-laying, and straw-plaiting give him dexterity in his kindergarten period; clay-modelling, more advanced, cardboard and raffia work occupy him in the lower school; and finally cardboard-modelling and woodwork, applied especially to rural subjects, in his last period, finish his course. And then in the succeeding years there should be the continuation class which still remains a dormant factor in consummating our educational system. Two or three courses of this training, with its opportunities for specialisation, should produce a truly intelligent handworker of value to the rural interests in which he will henceforth be involved, and therefore of value to himself.

Our Prospects.

It is no easy task to outline for one's brethren a hard and fast scheme whereby these estimable objects may be secured. What is of primary importance in one locality falls to the rank of secondary essential in another. In every case the work should be centred around points of rural interest, and suggestions in this direction will occur in plenty to the mind seeking them. The great difficulty, as we have seen, is the equipment of the school. Some estimable theorists—and under this category I unreservedly place all who voice an opinion upon rural school matters, and have not taught in a rural school—have endeavoured to obviate this difficulty by advocating centralisation. This scheme would group schools, so that the children might be conveyed to some central point for instruction. Waste of time in travelling, expenditure on conveyances, and the derogation of the *personnel* of the individual school are weighty arguments against such a scheme. In the long run it would be far cheaper and much better to equip each school, and the hand of time—that beneficent salve of all our trials—will efface all difficulties. In such case the teacher is the only remaining difficulty. Is he able to tackle the great subject of handwork teaching? Most often he is not; and still it does not matter, for he is indeed a dull man who cannot master the educational side of such interesting work. The Council special teacher will do the rest, as in cookery, while the teacher preserves the organic whole of his schemes. In the eyes of the theorist, who sees all things from the outside, the hopelessness of the teacher is the paramount difficulty; while to the teacher, who is perfectly acquainted with the drawback of the whole scheme from within, the paramount obstacle is the theorist. Some day, we hope, they will break down the barrier, join forces, and carry the work to a great and glorious issue.

Our Art and Handwork Section.

NEEDLECRAFT FOR PRIMARY AND SECONDARY SCHOOLS.

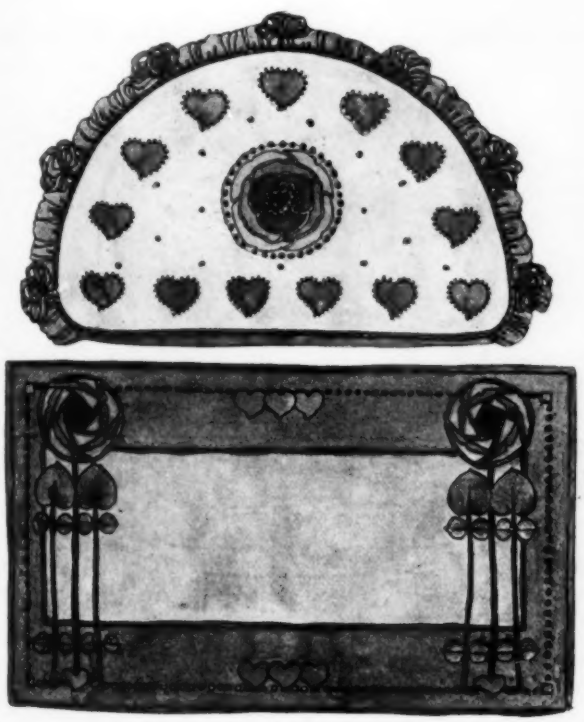
BY ANN MACBETH AND MARGARET SWANSON, INSTRUCTRESSES AT THE GLASGOW SCHOOL OF ART.

PART IV.—(*Continued.*)

THE adult, normally speaking (like the child and the adolescent), does not crystallise her ideas uniformly, although a stereotyped fashion might try to make one believe differently. True, each may have produced change in her material, and become acquainted with the properties of calico and linen and woollen material, yet the fact remains that some can only think of what they have done, not of what they may do. The purpose of material is limited. The worsted thread may knit the stocking, may darn the hole: there its meaning ends, for them.

Yet to treat and handle even darning in many different ways (as already shown in the previous numbers of this magazine) gives the adult a greater vigour in the world in which she lives. And while she neatly darns holes for comfort and use, she may equally darn the neck of a bodice or the ends of a towel for comfort and ornament.

In addition to the emotions, the quality of ownership, which is an essential quality of sanity, appears markedly in the adult. For this ownership, this well-keeping of our possessions, lies at the root of all patching, mending, repairing, and general beautifying. Because of this, the habits of neatness, order, and method are strengthened, which reacts one way in an anxiety to understand more about material.



DIAGRAMS 77, 78.

DIAGRAM 80.

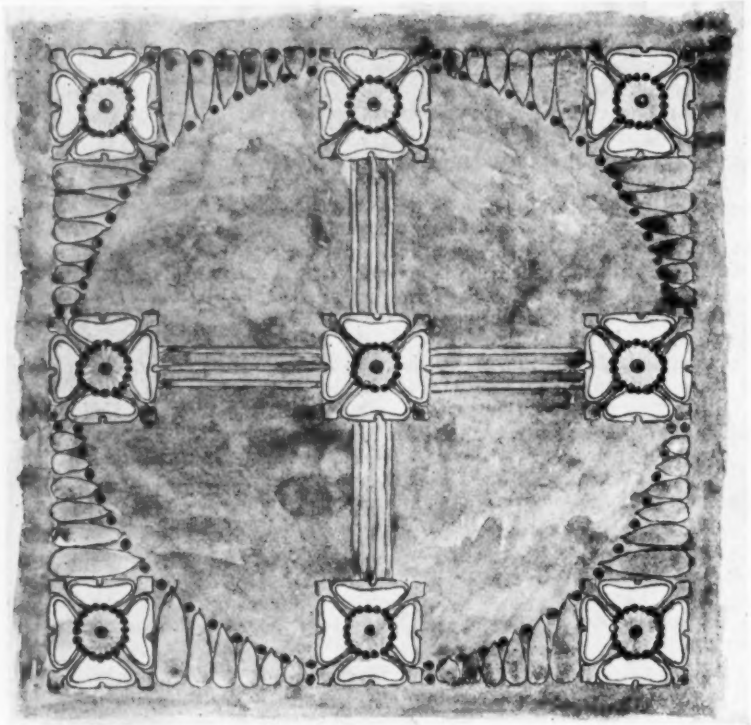


Diagram 79.

And at this juncture—brilliant, though perhaps short—it is very desirable that the eyes of the student be opened to the fact that *expense does not mean beauty.*

There is a tendency in extension or continuation classes to decorate materials which have in appearance the look of expensive stuffs, and this is a tendency to be promptly checked. Silks and satins are, as a rule, unsuited for use in the house of the average citizen, and are only appropriate for occasions where luxury can be indulged in. And inferior silks and satins are utterly and unquestionably undesirable for household use at all, and are not worth the labour so often expended upon them.

Simple, ordinary cotton materials, granted they are good of their kind, may be used in such a way that they result in a masterpiece of suitable and beautiful decoration and workmanship. Other materials also are well suited for purposes other than those for which they are nominally designated.

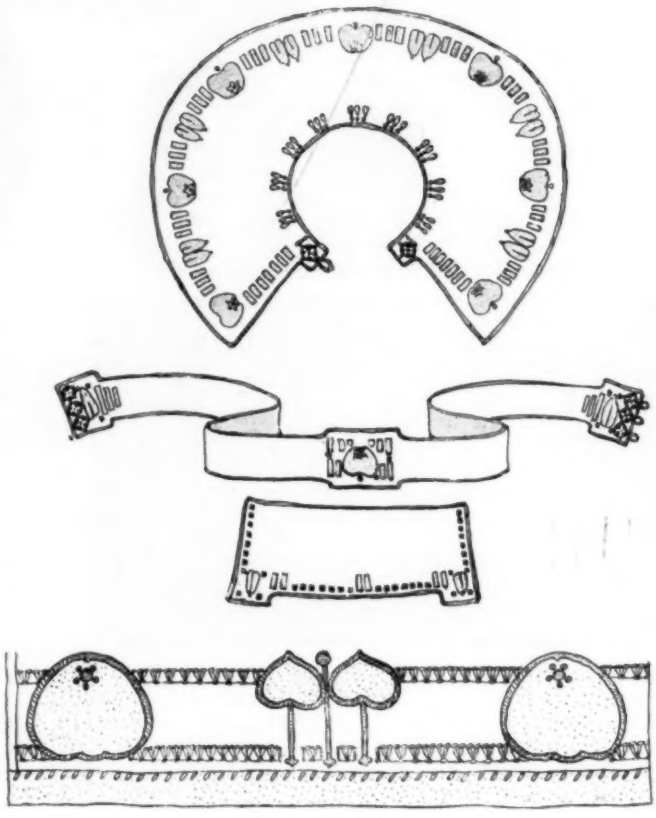
Exercise of choice in these gives scope for much originality of treatment, and gives to them a greater interest, with, at the same time, an enlargement of environment. Here we have beautiful, inexpensive, unfading cotton fabrics which are made for casement blinds, and which may be made almost more suitably into washing dresses. They have a little more body than the usual cotton dress materials, and wash and iron much more satisfactorily than linen for this purpose. Very pretty and serviceable dresses for ladies and children may be made out of the strong prints used for servants' dresses. Some little distinctive ornament may be added by the introduction of pipings and buttons of a plain colour to harmonise with the dress.

A very soft cotton canvas used for greenhouse shading can be employed for window-curtains and coverlets. It is made with a wide and small mesh, and costs about 11d. per yard, 72 inches wide. It has a charming effect if darned with coloured wools, and washes admirably.

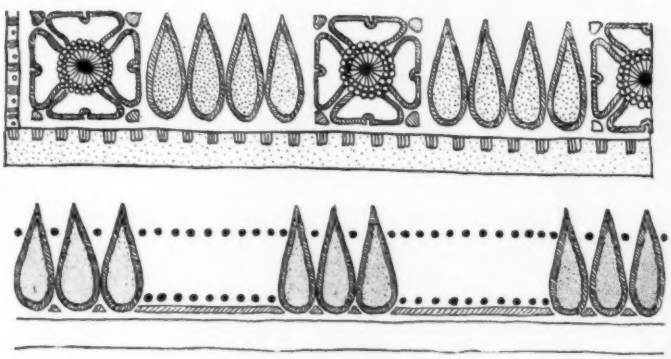
Plain Russian crash towelling makes beautiful covers for toilet-tables and sideboards. It is of good hand-woven linen, and is very inexpensive and wearable.

Various linen towellings, drill, checked and spotted damask, make delightful substances for household wear, and they may be decorated in all manner of materials.

For actual sewing threads for



Diagrams 81, 82.



DIAGRAMS 83, 84.

embroidery, coloured mending yarn is admirable and cheap, and may now be had in a great variety of colours.

Cottons imitating silks do not keep their appearance well, and never look so good as the coloured marking cotton already advocated in our earlier articles.

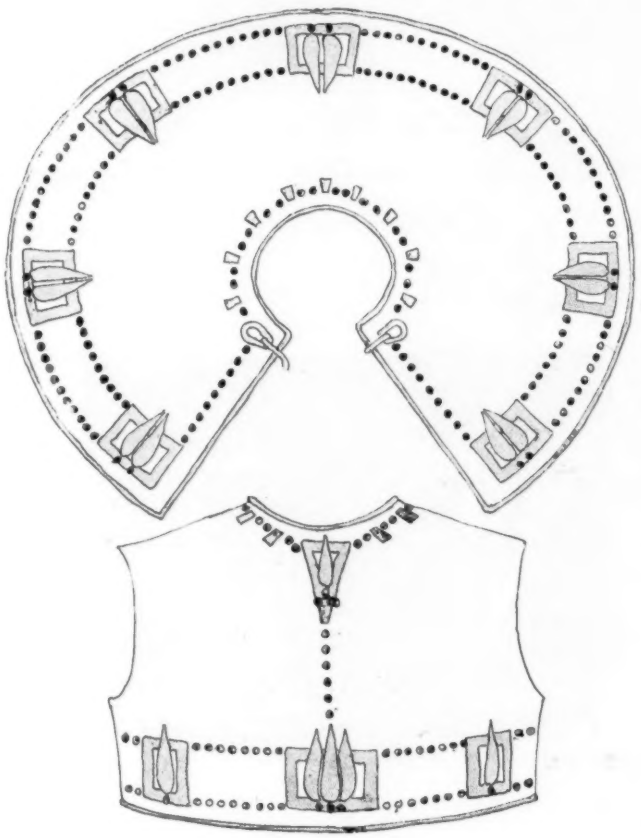
Linen threads are to be had in infinite variety, but are apt to be a little hard in the working.

Silks, although dearer, are very durable and rich, and, as a rule, any tendency of the colours to fade is notified by the manufacturer.

There are many beautiful substances offered in lieu of silk. A very glossy thread made of wood-fibre is to be got; but this will not wash, and must be carefully used.

Diagram 77 shows a tea-cosy which may be made of white damask, or linen, or cotton, or very good silk. The design is of the simplest, and is sewn in satin stitch. The panels are piped with a contrasting colour and tacked over the cosy, which is already covered with silk.

Diagram 78 illustrates a cushion in linen appliqué.



DIAGRAMS 85, 86.

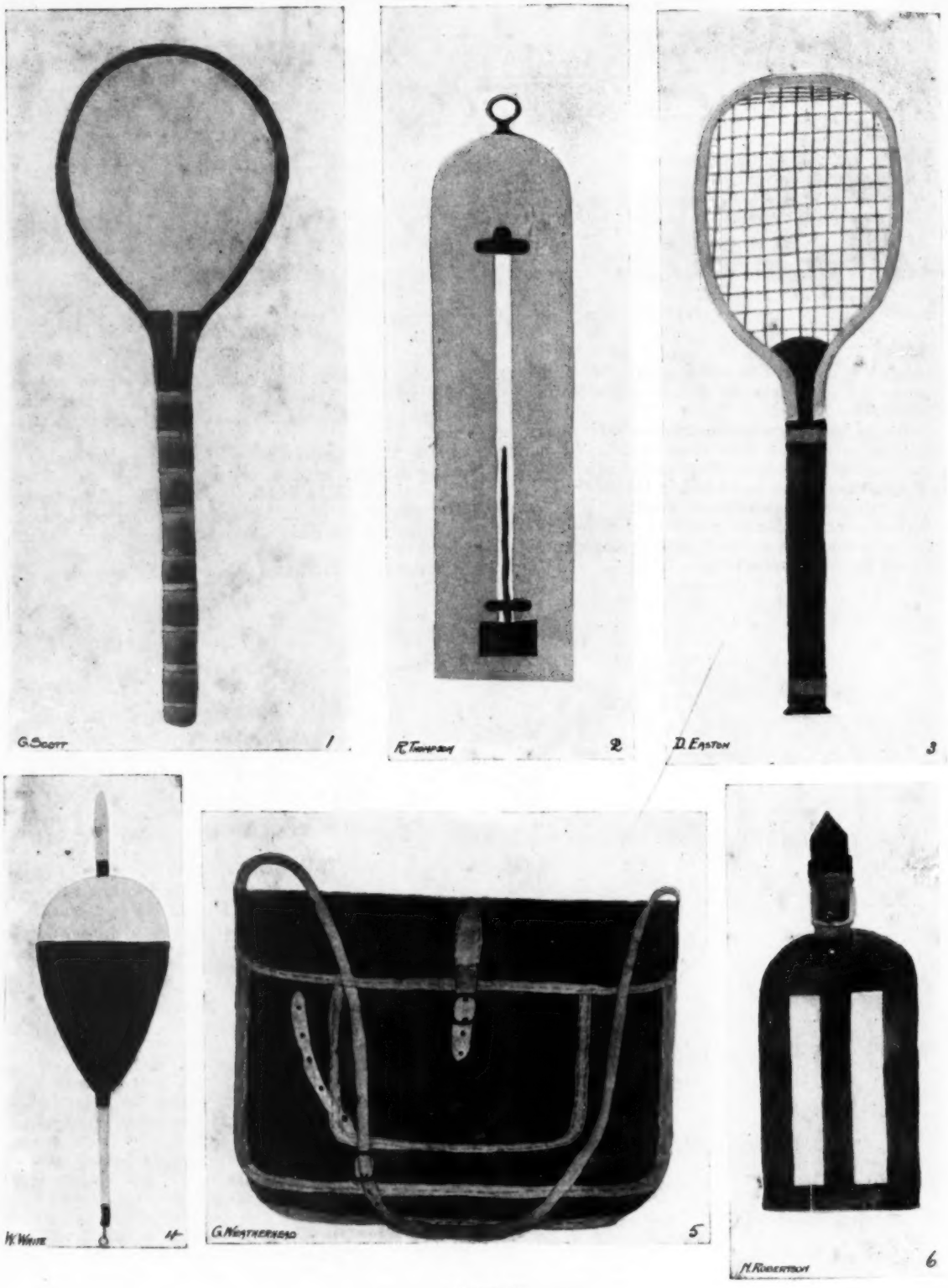


PLATE III.

DRAWING IN ELEMENTARY SCHOOLS—JUNIORS.

The leaves, stems, and outlines of the flowers may be sewn with satin stitch in silk, wool, or linen thread.

Diagram 79.—A cushion or tablecover in wool or linen. The design is based on a simple square form and a leaf shape, and may be carried out in appliqué linen, if on a large scale, or sewed with satin and Oriental stitch on a smaller.

Diagram 80.—A yoke for a dress. It may be carried out on cotton, linen, wool, or washing silk. The design is a variant of No. 79, and may be worked partly in appliqué or entirely in satin stitch.

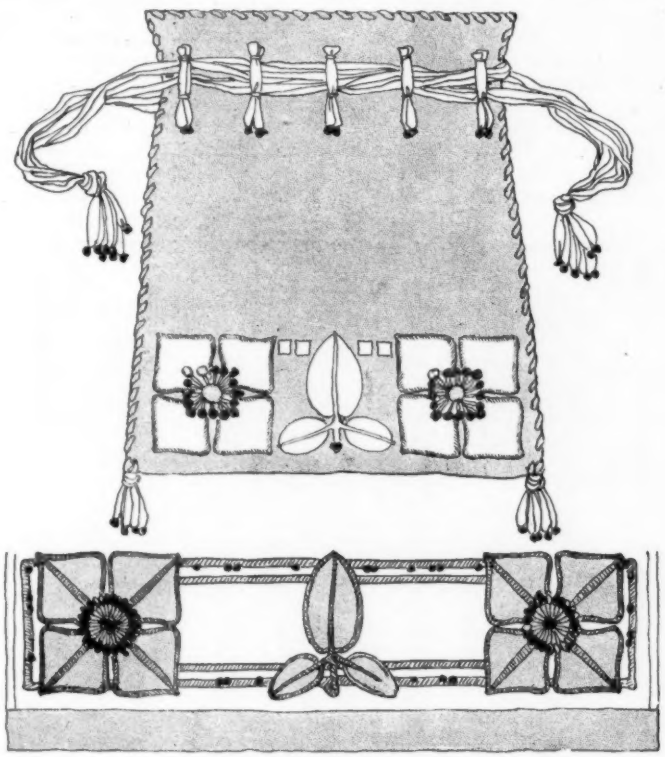
Diagram 81.—Collar, belt, and cuff for a dress. The design is based on the apple, with the addition of a simple leaf and squares. It may be carried out on linen in satin stitch, a piping of contrasting colour to be set round each, in order to give firmness and finish.

Diagram 82.—End for a sideboard cloth or table mat, based on the same as No. 81, with lines of open hem-stitching between the appliqué leaves and apples—a hem in the same colour as the appliqué to be added at the ends.

Diagram 83.—A border for table or toilet cover, based on the same forms as No. 79. It may be worked in linen appliqué, sewed in satin stitch in silk, cotton, or wool.

Diagram 84.—Another border design of a simple leaf shape, with connecting lines of spots. This is very suitable for appliqué on linen.

Diagram 85.—A child's tippet, to be sewed on wool or linen in satin stitch. The design combines the leaf of No. 84 with a square mass behind.



Diagrams 87, 88.

Diagram 86.—A child's dress yoke, the same as the above.

Diagram 87.—A bag with appliqué design based on square flower and leaf shape. The seams may be sewn with very narrow ribbon or braid, and several rows of this form the strings.

Diagram 88.—This is also based on the same *motif* as No. 87, and is suitable for linen appliqué.

(*To be continued.*)

DRAWING IN PUBLIC ELEMENTARY SCHOOLS.

TILLMOUTH COUNCIL SCHOOL, CORNHILL-ON-TWEED.—II.

BY DAVID SUMMERSON.

Juniors.

THE junior section of the school is composed of Standards II. and III., though all the children in these standards are not necessarily in the junior group. If a boy in Standard III. shows proficiency, he is promoted to the seniors' class. He may fall a little below the general level of the seniors, but he will make more progress by doing work in advance of the juniors than by drawing things he can already do well.

Coloured crayons now give place to pencil and brush, and rubber is allowed. Water colours are provided by

the school, though many of the children like to bring their own boxes. Reeves' Primary Box is useful for this class. If the colours need supplementing, we have a good assortment belonging to the school to fall back upon. The brush is a good Siberian hair, No. 5, a little expensive at first, perhaps, but a brush that can be used for years.

A little pure brush-drawing is taken at the beginning of the year, chiefly that the children may acquire dexterity in using the flexible point. With this end in view, simple round or oval objects are placed before the class, and a patch of colour is made as large as the object. The edge is brought to the correct shape while the colour is still wet. Fruits and leaves with easy outlines, such as the orange, lemon, pear, dock, violet, and poplar, are the most satisfactory things to work from. Then follow a few lessons on filling in flat colour with the brush. For these we use the easy rectangular objects the children draw in Standard I.

More attention is given to the material of which the object is made than was possible in Standard I. The tennis racquet, for example, is made of two kinds of wood, one of which is bent and carries most of the strain. Therefore the wood will be tough, strong, and pliable. The other is light, since it has little work to do, and pleasant to the touch. That explains why ash is the chief wood used in the construction of the racquet, and why the handle is faced with cedar. A few comparisons familiar to the children make it perfectly clear that there is a special fitness in using ash and cedar—our big trout is landed with a net having an ash bow, the grip of a fishing-rod butt is often of cedar.

Reasoning on these lines before the drawing begins rouses interest and quickens intelligence, and with it all we are teaching the children *to see*. I do not think many children, after the above explanation, would be content to call the racquet finished unless they had shown the two woods in two different tints. So it happens that

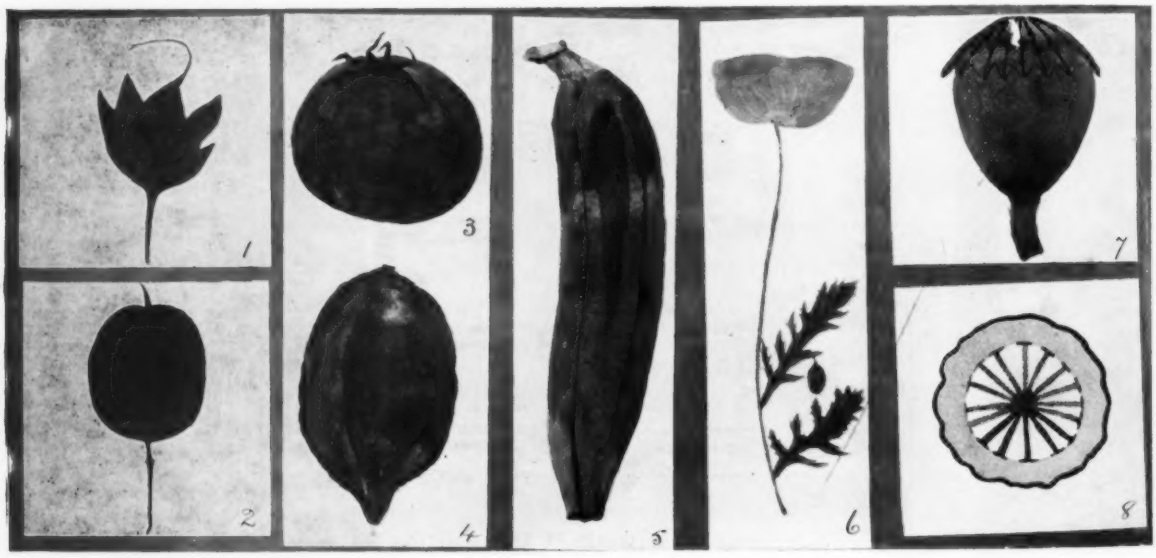


PLATE I.

These exercises are valuable because they give the child confidence in using a medium new to him, and because they enable him to see what the brush is really capable of. He finds out that he can get a good broad band of colour or a thin even line just as pressure on the point is regulated; the coloured copy must be kept wet if he would avoid streakiness, and therefore he needs a full brush; to avoid smearing he must begin at the top and work down to the bottom, and so on.

The time allotted to the subject is fairly evenly divided between object drawing and drawing from Nature. Many of the objects are the same as for Standard I., and they are similarly graded; but in addition many which are irregular in form are introduced, such as a baby's rattle, wooden mallet, small weeding fork, card of mending wool, leather luggage label, padlock, cup-and-ball. These are pleasing in colour, varied in form, and there is purpose in each detail. The drawing lesson is incomplete if it has not set the children finding out why an object is such and such a shape.

the object should be carefully studied by the teacher in order that the pupils may derive the utmost good from the drawing lesson.

The actual drawing with the pencil follows the method already outlined. The aim is to get the children to draw quickly and accurately. As they begin to have a better knowledge of form, there will be less "finger-tracing," but the preliminary sweep over the paper should be insisted upon. Rubber should only be used to erase faulty lines after the correct line has been put in.

Care is needed to see that children of this age understand the difference between the pen or pencil as a writing instrument and the pencil as a drawing instrument, especially when much more time is given to writing than to drawing. If there is any sign of cramped movement, the result of holding either the wrist too flat or the pencil too near the point, practice in drawing bold circles or ellipses on large sheets of paper will put matters right. The children soon find that the correct way of holding the pencil is both easy and comfortable.

The colour work, consisting as it does of flat washes,

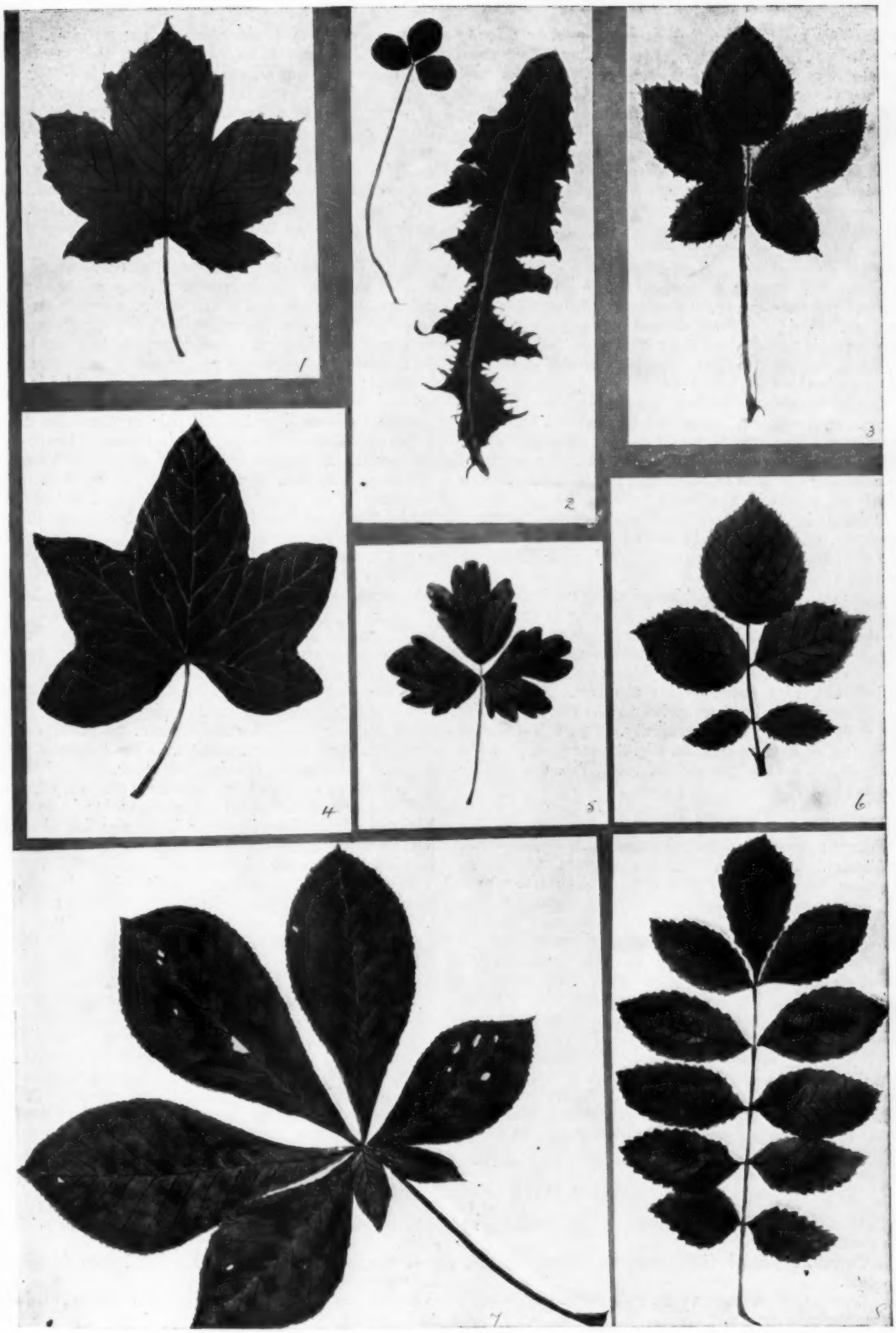


PLATE II.

is a simple matter. Still something should be done to give the children some sense of tone values. Each child should have a slip of paper, and try to get the exact colour for himself. The "primary" box contains Prussian blue, gamboge, crimson lake, and yellow ochre. These colours should be supplemented by the following:—

Yellows—raw sienna and chrome.
Reds—light red and burnt sienna.
Blue—cobalt.
Browns—sepia or Vandyke brown.
Black—ivory black.

With such a range it is possible to get the tones fairly correct. The children should have lessons on colour-mixing. Let them mix different blues with different yellows and note the green produced, tinting an oblong on their papers. Add a little water to the green in the saucer; use more yellow than blue, etc., and note the result in each case. The secondary colours should all be made in this way.

Careful spacing out adds to the appearance of juniors' work. In drawing a battledore, they should first mark out the extreme length, leaving about the same space at the top and bottom of the paper, and then mark off so much for the head and so much for the handle. The width will vary with the length.

Objects involving perspective—Japanese lanterns, tumblers, and jars—should not be attempted just yet. If a child is sufficiently advanced for this work, he should be with the seniors.

Plate III. will show the kind of thing we have found suitable for juniors. The pencil drawing is as perfect as the child can make it before any colour is laid on. Fig. 1 is a battledore in three tints—a light wash of yellow ochre for the parchment blade, and crimson lake picked out with gamboge for the rest. The yellow bands round the head all point to the centre—one of the little things to notice carefully. Fig. 2 is a simple rendering of a thermometer, Fig. 3 a racquet, Fig. 4 a float, Fig. 5 a child's school-bag, and Fig. 6 a leather luggage label.

Nature Drawing.

Nature drawing is confined to leaves, simple flowers, and fruits. The leaves of all the common trees growing near the school and of the dock, plantain, violet, ivy, dandelion, clover, and laurel will be found sufficient for a year's work. I have seen fern fronds, bracken unfolding, ragwort, and carrot leaves given to juniors; but the teacher should not set work too much in advance of the children's attainments. Apart from the distaste for drawing which such exercises are apt to create, there is more merit in a simple thing done well than in a difficult thing done badly.

Our choice of flowers is limited. We cannot get far from "side views"—sweet peas, foxglove, convolvulus, crocus, snowdrop; or "front views"—wild rose, pansy, primrose. Flower buds are easier, and the wild hyacinth, lily of the valley, and wallflower can be tried, with such fruits as the tomato, orange, pear, lemon, banana, hips and haws, cherries, and seed-vessels like the honesty, foxglove, peas, beans.

The children know a day or two beforehand what they are going to draw, which ensures having well-grown, typical specimens brought to school. These are placed in water until required. Leaves with entire margins are taken first, and by degrees we work up to compound leaves. The lilac, privet, laurel, and lime are good to commence with. The laurel should be noticed as having flattened sides and a pointed tip; the lime has a flat base.

Compound leaves should be considered merely advanced forms of simple leaves. If a rose leaf is drawn on the blackboard and a line drawn round from point to point to enclose the whole leaf, the outer form will be found practically the same shape as the top leaflet. In compound leaves the top leaflet is generally symmetrical; the side leaves are not. A rose leaf is more or less vertical near the top, has the second pair of leaflets horizontal, while the pair at the base droop. A few minutes outside the drawing lesson spent by the teacher in thinking out his subject will not be wasted.

The examination of the leaf by the children brings out the following points—general shape, widest part, straight or rounded sides, base, wide or narrow midrib, many or few small veins, long or short stalk, slender or stout, margins smooth or notched, and so on.

Unless the leaf is carefully examined, we get veins and serrations put in haphazard, though the simple contour may be fairly correct. Careless observation and faulty supervision—allowing errors to pass by undetected—are to blame for what one hears of "pretty but inaccurate" drawing from Nature.

The actual drawing of a leaf is taken in this way. The length is marked off and the midrib and stalk drawn. So much is allowed for the midrib, so much for the stalk, and the width in relation to the length is determined. Then follows the simple contour. Serrations and veins may be shown after the general shape is correct.

A clover leaf is by no means easy for juniors, but half the difficulties disappear if the leading lines are put in first. Careful judgment is required to fix the position of the lower leaflets.

Plate I. shows seed-vessels and fruits. Fig. 1 is a side view of a foxglove; Fig. 2, honesty; Fig. 3, tomato; Fig. 4, lemon; Fig. 5, banana; Fig. 6, poppy; Fig. 7, Oriental poppy capsule; and Fig. 8 is a section of the same.

Where one tint merges into another, as green into yellow on the lemon and banana, the colours are run on together. The brown marks on the banana are put in after the yellow is dry.

The leaves on Plate II. are as follows: (1) Sycamore, (2) clover and dandelion, (3) bramble, (4) ivy, (5) columbine, (6) rose, (7) horse-chestnut, and (8) ash. (2) and (7) are the work of the same boy; the rest are done by different children.

HONOURS PAGE.

THE successful drawings selected this month are sent in by—

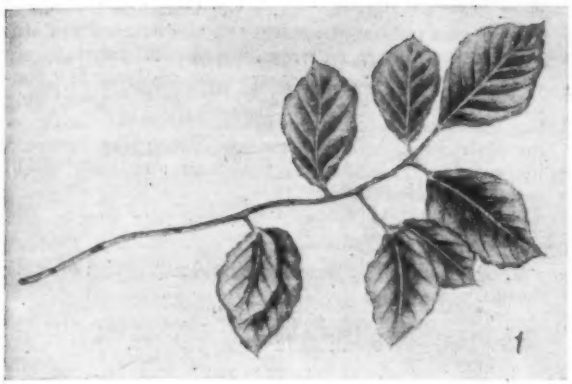
1. George Copeland (12), Longport Mixed School, Burslem.

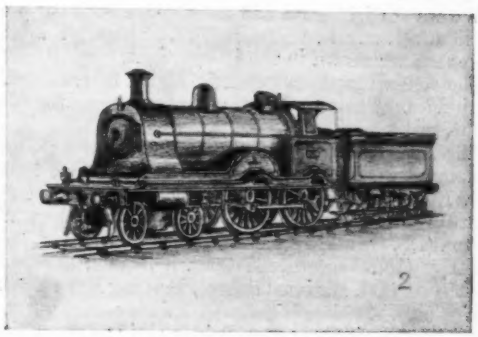
2. Laurence Waddington (15), Holt Secondary School, Sefton Park, Liverpool.

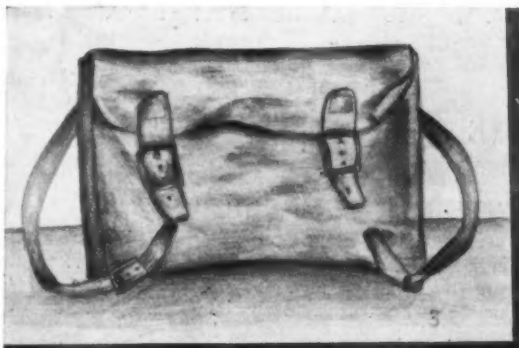
3. Robert Cumming (12), Beith Academy, Ayrshire.

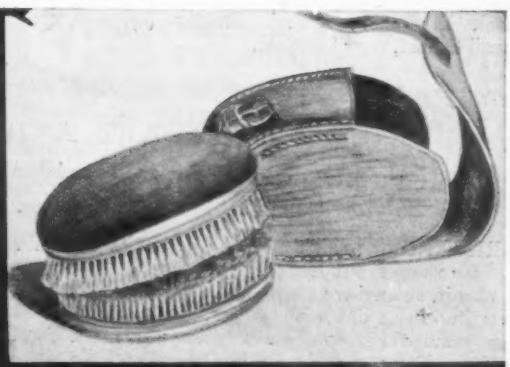
4. George Usher (13), Mantle Road Council School, Leicester.

5. William Warren (13), National School, Brierley Hill, Staffs.









HONOURS PAGE.

6. Frank Whitehead (12), Charnwood Council School, Leicester.

7. Joseph T. Price (11), National School, Brierley Hill, Staffs.

We are delighted to see such comparatively young scholars sending in thoughtful and thorough work of the character shown in the illustrations.

The following pupils' work is highly commended by the judges. This should spur them on to greater efforts in future.

Alfred Phillips (12), Enderby Council School; Joseph Langton (12), Enderby Council School; Fred Thorpe (12), Enderby Council School; Sydney Harwood (13), Thatto Heath Council School, St. Helens; Robert Warburton (12), Gray Street Council School, Bootle; Harry Sowerby (13), Earle Road Council School, Liverpool; John Hutt (12), National School, Brierley Hill; Stanley Jukes (12), National School, Brierley Hill; Oliver Plant (12), National School, Brierley Hill; Louisa Moyes (12), St. Patrick's Roman Catholic School, Liverpool; Annie Loughran (10), St. Patrick's Roman Catholic School, Liverpool; Connie Rodley (9), Blackburn Council School, near Sheffield.

The same remark regarding age applies also to the commended work. The standard of execution has risen very considerably since the time the "Honours Page" was instituted. Although the competition still continues popular, and many excellent drawings are received, yet after all they are comparatively few considering the vast amount of work produced. If only the teachers will give the scholars a little encouragement and guidance, the amount of work sent in would increase enormously, and the boys and girls would benefit by the practice.

The rules of the competition are very simple, but they should be rigidly observed.

1. Drawings must be original and not copies of other drawings, however good.

2. They must have the scholar's name, age, and full school address ON THE BACK OF THE SHEET.

3. They must be PACKED FLAT and sent at any time to J. Vaughan, 7 Campside Crescent, Langside, Glasgow.

4. We cannot undertake to return drawings sent in for this competition.

ART AND THE BOOK.

PRINTING AS AN ARTISTIC CRAFT.

BY W. E. SPARKES.

PRINTING was highly artistic from its beginning, for there is art not only in designing good types, but also in arranging the page, in spacing the lines, and in setting them out with fit and proper borders. In after years these excellences were too often found wanting. But the early printers merely tried to copy the manuscripts of their day; and these manuscripts, written by fine scribes, had reached their high station through the course of centuries, during which the most sensitive and most gifted artists had gradually refined the writing and illumination until it seemed impossible to add another single beauty.

Think for a moment how much went to the making of a fine manuscript. Already it had been found that spacing was of great importance in order that the page might be read easily. From very early times the scribes had seen that upright letters were clearer than sloping; they gradually cut away all useless and confusing flourishes; and, lastly, they saw that broad spaces about the page of writing were useful as a foil, as well as important in keeping the text free from accidental injury. Add to this the fine instinct which taught the illuminist just how large and how thick the initial letters should be in order to harmonise with the smaller writing; remember that his colours were not added without thought, but always with an eye to beautifying the page; and it is at once apparent that the early printers could not possibly have done better than follow the lovely manuscripts which were the pride and pleasure of scholars.

As years wore on and printing became common, this dependence upon the written book was gradually lost; the types became thin or badly designed; the spacing was less carefully considered; for the sake of cheapness in binding the generous borders were cut down close to the text; initial letters and illustrations were considered for themselves and without relation to the smaller type.

Within the past twenty years a few artists, such as William Morris and Mr. Charles Ricketts, have tried to bring back to the printed book some of the beauties that have been crushed out in the rush and stress of modern life. They have designed new types, each letter as carefully considered as if it were a picture in itself—as, indeed, it is; they set out the page with wide borders; the initial letters as well as the illustrations were made to play an important part in really ornamenting the page. When one opens such a book, the eye is satisfied with the mere harmony of lines, all set within a fixed and agreeable space; and then as each part is considered and found to be beautiful, one feels how much artistic feeling must have been brought to play in producing such a complete design.

And it is well to remember that these artists went back to early Italian printing for their examples, and based their new lettering firmly on the types which we now know were designed by capable artists. We shall never get back to the finest styles until we leave the planning of new types to men who have had a long course of artistic training, not merely in lettering, but in general design. For just as established artists designed Italian types, so, it is important to remember, the early writers of manuscripts were trained craftsmen, able to illustrate their pages with dainty pictures, delightfully drawn and coloured.

THE FIRST PRINTED BOOK: THE MAZARINE BIBLE.

So far as we know, the first book printed from movable types was what is known as the Mainz Bible, or the "Mazarine" Bible, or the Gutenberg Bible. The reasons for these various names are simple. Gutenberg is supposed to have printed it at Mainz. It is called the "Mazarine" Bible because the copy that first attracted attention was in the Mazarine Library at

de hebreis voluminibz additū nouerit eque usq; ad duo pūcta-iuxta theodotionis dumtaxat editionē: qui simplicitate sinonis a septuaginta interpretibus nō discordat. Hec ego et vobis et studioso cuiq; fecisse me sciens nō ambigo multos fore-qui uel inuidia uel supercilio malent contemnere et videre preclara quam discere: et de turbulento magis riuo quam de purissimo fōte potare. Explicit prologꝰ.

Incipit liber ymnorū uel cōfessionū

Beatus vir qui nō abiit in cōsilio impiorū: et in via peccatorum nō stetit: et in cathedra pestilētie nō sedit. Sed in lege domini voluntas eius: et in lege eius meditabit die ac nocte. Et erit tamq; lignū quod plātatum est secus decursus aquarū: qđ fructū suū dabit in tpe suo. Et folium eius nō defluet: et omnia quecūq; faciet prosperabūtur. Non sic impij nō sic: sed tamq; puluis quē proicit uētus a facie terre. Ideo nō resurgūt impij in iudicio: neq; peccatores in cōsilio iustorū. Quoniam nouit dominus viā iustoꝝ: et iter impiorum peribit. Psalmus dauid

Quare fremuerūt gētes: et pplī meditati sunt inania? Astiterūt reges terre et principes cōuenerunt in unū: aduersus dūm et aduersus xpistū ei⁹. Dirumpam⁹ uincla eoꝝ: et proiciam⁹ a nobis iugū ipoꝝ. Qui habitat i celis irridebit eos: et dūs subsānabit eos. Tunc loquet ad eos in ira sua: et in furore suo cōturbabit eos. Ego autem cōstitui⁹ sum rex ab eo super syon montem sanctū ei⁹: predicās preceptū eius. Dominus dixit ad me filius meus es tu: ego hodie genui te. Postula a me et dabo tibi gentes hereditatem tuā: et possessionē tuā fines terre. Reges eos i virga ferrea: et tanq; vas figuli cōfringes eos. Et nūc reges intelligite: erudimini q̄ iudicatis terrā. Seruite dño i timore: et exultate ei cū tremore. Apprehendite disciplinam: ne quādo irascatur dominus et pereatis de via iusta. Cum exarserit in breui ira eius: beati omnes qui confidunt in eo. Psalmus dauid cū fugeret a facie absolon filij sui.

Domine q̄d multiplicati sunt qui tribulāt me: multi insurgūt aduersum me. Multi dicūt anime mee: nō est salus ipsi in deo eius. Tu autē dūe susceptor meus es: gloria mea et exaltās caput meū. Voce mea ad dominū clamaui: et exaudiuit me de mōte sācto suo. Ego dormiui et soporatus sum: et exurrexi quia dūs suscepit me. Non timebo milia populi circūdantis me: exurge dūe saluū me fac deus meus. Quoniam tu percussisti oēs adūsantes michi sine causa: dentes peccatorū cōtriuisti. Domini est salus: et super populū tuum benedictio tua. In finem in carminibus. psalmus dauid

Cum invocarē exaudiuit me deus iusticie mee: i tribulatione dilatasti michi. Miserere mei: et exaudi orationē meā. Filij hominū usq; quo graui corde: ut quid diligitis vanitatem et queritis mēdacium? Et scitote quoniā mirificauit dūs sācti suū: dūs exaudiet me cū clamauero ad eū. Irascimini et nolite peccare: que dicitis in cordibus vestris in cubilibus vestris compungimini. Sacrificate sacrificiū iusticie et sperate in domino: multi dicunt qs ostendit nobis bona.

A Page from the First Printed Book, the "Mazarine" Bible. About ⅔ of original size.

(*By courtesy of the Director of the British Museum.*)

Paris. It is a marvellous book. One would have expected the first book to be rough in workmanship, poor in design, and quite unworthy to be placed beside the manuscript Bibles from which it was copied. Its excellence is a proof of the immense trouble taken by Gutenberg and those who assisted him.

Metal dies for stamping moulds in which types could be cast required a very skilful workman. But one must remember that the mediæval artists were fine workmen, skilled in many arts. The same man was often a sculptor, painter, metal-worker, and builder. If a goldsmith (and many great artists were apprenticed to goldsmiths), he was generally clever at all the arts.

Gutenberg is known to have been supplied with money by Fust, the goldsmith, who would find little difficulty in cutting punches in hard metal for each letter. He had often had similar jobs to do in the ordinary way of business, in making ornaments and trinkets. But it must have been a trying time before Gutenberg was able to "set" a page properly. Perhaps only a practical printer can appreciate what he must have gone through before producing a perfect page of print.

(This splendid Bible is in two volumes—324 leaves in the first, and 317 in the second. It was printed both on paper and on vellum. More than thirty copies are known to exist; but in spite of this, one copy printed on paper was sold in 1884 for £3,900.)

The Pope's Indulgence.

Now such a work could not be kept wholly secret. It must have soon become known to the Church; for while the Bible was still in the press, being painfully printed page by page (it is thought that as each page was completed the type was distributed and set up again for the next page), the news of the invention reached Rome. At that time Pope Nicholas the Fifth had granted "indulgences" to all who should assist the King of Cyprus in his struggle against the Turks. With these indulgences in hand, written on parchment, the agents of the King of Cyprus wandered about Europe selling them to the highest bidders. As the owner of such an indulgence could obtain absolution from all sins, once in life and once in the hour of death, and could escape all previously determined punishments by the Church, provided he repented and made amends, one may readily believe that these strips of parchment had an eager market. More and more copies were needed. At any rate, while the Mazarine Bible was still in the press, Gutenberg appears to have received an order to print a certain number of these indulgences—for the large type agrees with that used in his Bible.

Spaces were left on the parchment to fill in the names of the donors, the sums they paid, and the date of payment. From this latter fact it has been discovered that the *printed* indulgence was on the market in 1454, shortly before the Bible, which probably first appeared in public in 1455.

Gutenberg was in debt to Fust, and never seems to have been able to discharge his debts; for soon after his magnificent Bible was brought out he had to give up his presses and whatever rights he may have had to Fust and Schoeffer, the latter being an illuminist and son-in-law to Fust. These men in partnership afterwards produced many fine books.

It is rather confusing to find that the Mazarine Bible was followed shortly after by a very similar Bible, and that, moreover, there was a *second* indulgence printed in type borrowed partly from this second Bible. One is tempted to believe there were two presses at work, though both were perhaps controlled by Gutenberg and financed by the goldsmith Fust.

A Page from the Mazarine Bible.

The Bible was printed in Latin. The page selected shows the beginning of the Psalms, the large initial B introducing the first verse, "*Beatus vir*" ("Blessed is the man that walketh not in the counsel of the ungodly").

The type is based directly upon the handwriting used in illuminated manuscripts at Mainz about 1450. How evenly beautiful the writing had become can only be believed by those who have an opportunity of studying manuscripts in all countries. There is, indeed, a legend (it may have been true) that the first German printer who carried the art to Paris found himself in an awkward corner by reason of the rapidity with which he produced books. Gutenberg's invention was still unknown at Paris; and when this new arrival from Germany, announcing himself as a scribe, carried out his orders in a few weeks instead of months, it began to be whispered about the city that this German was in league with the evil one, who, for the price of his soul, wrote out books with infernal swiftness. In the end the hapless printer was brought before the Church, and after a few unmistakable hints, lightly touching on the wheel and the thumbscrew, he revealed the new invention.

If only a legend, the story is interesting. It shows that printing and handwriting were hardly distinguishable, so closely did the printer copy the scribe.

Moreover, to show how closely the arts were connected, the early printers copied even the contractions which had become common in manuscripts. The reader of Latin will find several on the page produced here.

Again, in manuscript Bibles the headings to the chapters, as well as the first letter to each verse, were generally written in red. This "rubrication" was almost invariable. Gutenberg, however, was faced with a difficulty—the difficulty of a double printing, once for the black type, and the second time for the red. What more natural than to leave out all the first letters from the verses and then to call in the rubricator to add these by hand? He might at the same time add the other "rubrics," such as "Here begins the book of songs and meditations," or "A psalm of David when he was fleeing from the face of Absalom his son."

The reproduction does not, unfortunately, show the difference between the black type and the red lettering by hand. But if the reader will look at the line immediately above the large initial B, he will read, "*Incipit liber ymnorum*," etc. ("Here begins the book of songs"). Now this is one of the lines *written* in red; yet it is not easy at the first glance to detect any difference between the written and the printed word. This is an illustration of what I said above, that the early printing followed handwriting closely, and that the script was as regular as the print.

The fine initial B has bands and touches of blue in addition to red. For a long time this letter was thought to have been written also; but later authorities believe it to have been cut out on a separate block, and then impressed by hand on the printed page. One reason

Beati qui lauant stolas suas in sanguine a-
gni: ut sit potestas eorum in ligno vite: et per
portas intrent ciuitatem. Foris autē canes
et venefici et impudici et homicide et ydolis
seruientes: et omnis qui amat et facit men-
dacium. Ego ihesus misi angelum meum te-
stificari vobis hec in ecclesijs. Ego sū radix
et genus dauid: stella splendida et matuti-
na. Et spiritus et sponsa dicunt veni. Et qui
audit: dicat veni. Et qui sitit veniat: et q̄ vult
accipiat aquā vite gratis. Contestor enim
omni audienti verba ꝓphetie libri huius. Si
quis apposuerit ad hec · apponet deus super
illū plagas scriptas in libro isto: et si quis
diminuerit de verbis libri ꝓphetie huius · au-
feret deus partē eius de libro vite et de ciui-
tate sancta: et de bijs que scripta sunt in li-
bro isto. Dicit qui testimoniū phibet istorum.
Etiam: Veni o cito amen: Veni dñe ihesu.
Dīa dñi nri ihesu cristi cū oīibus vobis amē.
Explicit liber apocalipsis beati iohānis apli.

Pñs hoc opusculū Artificiosa adinuētione
imprimendi seu caracterizandi · absq; calami
exaratiōe · in ciuitate Moguntī sic effigiatū ·
q̄ ad eusebiā dei industrie per Johēz fust ciuē
et Petrū schoiffher de gernsheym clericū di-
oteſ eiusdem est consūmatuz. Anno dñi · M ·
cccc · lxij · In vigilia assumptōis virg̃ · marie ·

A Half-Page from Fust and Schoeffer's Bible.

(*By courtesy of the Director of the British Museum.*)

for thinking this is that the ornament overlaps the printed letters here and there. Other initial letters were impressed in this Bible in the same way, but as the work progressed this was evidently found to be unsatisfactory, and the remaining initials are drawn entirely by hand—a practice that continued for some time in printing, and gave much employment to the unfortunate illuminists, who found their business decreasing as manuscripts were less in demand.

Black-Letter and Other Types.

These handsome and stately pages were followed by printers in all countries. They took immense pains to cast beautiful type, which was set out with a fine regard for effect. As might have been expected, these types varied greatly. For instance, when the German printers made their way to Rome, they found the manuscripts in Italy written in Roman characters, and at once they set about casting letters in that style.

Yet so strong was tradition that for at least a century and a half it remained the practice to print religious books in the Gothic character, in "black-letter," so called because the type was thick and substantial. True, experiments without end were made. One must never forget the part played by the Church. For a long time the books were mainly Bibles, psalters, and other similar works, because there was a great demand for these rather than for romances and other secular books; though in this connection it is interesting to note that William Caxton early broke down the tradition in England, as we shall see.

Now the Church was everywhere closely in touch with Rome. From the papal capital ambassadors were continually passing to and from the chief European cities; and one is not surprised, therefore, to find the Latin characters used more and more in type, and black-letter gradually giving way before its powerful rival.

Soon after poor Gutenberg became bankrupt his business passed to Joseph Fust and Peter Schoeffer, whose handsome books are world-renowned. Even so soon as 1462 these partners are found printing in a type copied directly from a delightful script which was common in Italy.

The half-page produced here is from their Latin Bible, printed at Mainz in that year.

A Column from Fust and Schoeffer's Latin Bible, 1462.

This is the last column of that magnificent book. Could any print be more splendidly artistic in form, or could it be set out with finer effect? We linger over this grateful page, and sigh for a return to such delightful art. In the short time since the Mazarine Bible was produced the craftsmen had learned how to print in two colours on the same page. The last line of the first paragraph ("*Explicit liber*," etc.—that is, "Here ends the revelation of the blessed apostle John"), as well as the small paragraph beneath, with its curious double shield below, is in red, printed from the same types as were used throughout.

And here we may mention how the first books differed from the later. In former papers I have pointed out how the weary scribe recorded his satisfaction at arriving at the end of his long labour—a satisfaction often ending with a prayer for the nobleman who had caused the book to be written, or with a pious exclamation devoting the manuscript to the Virgin Mary, who was besought to remember the writer for his pains. Sometimes, alas! these exclamations are startling in their humanity, the scribe throwing down his pen and asking for mundane rewards, including meat and strong drink.

What more natural when books came to be printed than that this custom should be continued? In modern books the *title-page* sets out in full not only the subject and records the author's name, but gives the place and date of publication. All this information was gradually incorporated with the prayers and exclamations with which the scribe closed his work; and, indeed, as time wore on the prayers were omitted for a merely business-like announcement.

In this present Latin Bible this end paragraph (or *colophon*, as it was called) puts on record that Joseph Fust and Peter Schoeffer completed the work in Mainz in the year 1462, "on the evening of the Assumption of the Virgin Mary." Not until the next century do we find title-pages commonly placed at the beginning of the book.

The shields below are the trade-marks of Fust and Schoeffer. Probably they had no meaning in themselves. Caxton had a singular device, curiously enough made up of a cross and a form like a figure 7, interlaced, and much ink has been spilt among authorities in trying to prove that this device has a hidden meaning, some thinking it referred to Caxton's age, others as confidently asserting that it was a mark he had used when engaged in the wool trade!

What more concerns us here is to note how very satisfactory this design fits in as an ornament to the page. Even in much later times, when the title-page had taken its present place once for all, little "tail-pieces" became the fashion, sometimes mere ornaments without any reference to the text, and sometimes, as in William Bewick's delightful engravings (early nineteenth century), complete little pictures with figures and landscape.

It is curious to note this interplay. The printed book first copied the illuminated manuscript, without, however, attempting to find a place for the exquisite paintings which (as shown in our former papers) were often gems of complete art. Gutenberg and his followers for some years were content to grapple with the difficulty of simple initial letters; but, anxious to rival the illuminated manuscripts, it was not long before the printer left spaces in his book to be filled in with pictures painted by professional illuminists. This curious but happy working hand in hand of two crafts led the way to a free use of wood engraving; so that instead of the illuminist drawing the picture, he was called in to colour those which had been printed in outline from blocks wedged in among the type.

It was not a long cry from such initial letters to engravings printed above the text—that is to say, the illustrated book came into being.

Once set on the path, the wood engraver followed it sometimes to absurd lengths. He surrounded the text with an involved border which became too insistent. At first these borders were fine decorations; afterwards they distracted the attention from the text.

With the modern abuse of illustrations, crowding as they do without rhyme or reason, and jostling the type aside, has come a contempt for artistic lettering. I have mentioned attempts that have been made by artists here and there to return to the beautiful pages set out by the first printers. After all these years, Gutenberg, Fust, and Schoeffer could point to their

books with pride, and challenge comparison with the latest machine-printed book. And in the same way, the early Italian and French wood engravers might justly be contemptuous of modern illustrations, which are drawn without any regard to the type placed about them. In fact, the printed page is no longer considered as it should be, and could again easily become a design harmonising in all its parts, a thing beautiful to look at, even apart from the subject with which the words have to do.

THE HISTORY LESSON AND DRAWING.

COSTUME.—PART II.

BY W. H. ELGAR.

AS stated at the commencement of Part I. of this article, no attempt can be made to give even the slightest sketch of the development of costume in England. All that has been done is to collect such records as happen to be within reach or have been obtained on previous occasions, place them in fair chronological order, and describe them. If these descriptions appear to the expert superfluous, it should be remembered that most of us see only what we look for, and, as the saying has it, "we bring away only that which we take to a place."

Almost all of our illustrations show a long, flowing garment, cut and secured in various ways; and perhaps the most flowing, ample, and curiously secured is that shown in Fig. 1, which represents Joan, wife of Sir John de Northwode, and is a drawing from a brass in Minster Church, Sheppey. This drawing has been carefully reduced from a good rubbing, by the aid of the camera lucida, as were others in Part I. and most of our present illustrations. Consequently they can be taken as reliable as to detail.

1

The long, flowing mantle must have been a warm garment, being lined with *vair*, a kind of fur, supposed to have been composed of the skins of a species of squirrel or weasel, gray on the back and white on the under sides. This lining shows at the base of the great folds to the left, at the arm openings, and on the two great lappets hanging from the shoulders over the breast.

It would be interesting to see such a shaped garment off the person, for it seems to have been without fastenings, and must have been put on over the head. However, gathered under the right arm into graceful folds, it has a most pleasing effect.

Under the mantle is a long and close-fitting kirtle with tight sleeves, having narrow bands at the wrists.

Round the throat is seen the wimple, which in this case just covers the chin, and is stretched out, enveloping the ends of the great plaits of the hair and probably covering it behind. It seems that the higher the rank the higher the wimple became: it covered the lips of princesses, but only just reached the chin of a knight's lady. It is worth while to notice the long, peculiar shape of the diapered cushion on which the head rests.

Beneath the right foot crouches a rather spaniel-like dog, having shaggy forelegs and tail, and with a collar having bells round its neck. To show these very modern-looking bells an enlarged sketch of this part has been made (Fig. 2). When we remember that the date of this brass is 1330, the persistence of this form of bell will be apparent.

A lady in the costume of about the time of Agincourt (Fig. 3) was still clothed in a long, flowing dress, there being no separate bodice. The short waist, full sleeves, and fur collar must have given a decided character to such a garment; but the most striking feature to us is the peculiar headdress. This headdress, which has been

2

termed *horned*, was built up by means of side nets and covered with a veil reaching to the shoulders.

Our fourth illustration represents the wife of William Grevel, a merchant, whose brass was given in Part I. We see here the same prolonged sleeves of the undergarment protecting the backs of the hands as in the husband's figure, gloves not then being usual; the long robe with normal sleeves, buttoned all the way down the front and unconfined at the waist; and a very peculiar dress for the head. This headdress has been termed *nebule*, from its supposed resemblance to a cloud. From beneath this cloud the hair appears to hang freely, only to be again confined by two knob-like ornaments at the shoulders.

One of the finest of the incised stone slabs in England is at East Hornden Church, Essex. It is of alabaster, 6 feet 6 inches by 3 feet, and is to the memory of Lady Alice Tyrell, 1422 A.D. (Fig. 5). Lady Alice is shown in a long, loose robe, having long, loose, hanging sleeves, turned back to show the lining (often called *tabard* sleeves),

confined at the waist by an ornamental checkered belt, and opened and turned back at the throat, where hangs a necklace and pendant. At the wrists the sleeves of the under-garment are gathered into bands, a method not seen in any other of our sketches; and at the feet the robe is spread in very decided horizontal folds, in striking contrast to that in the next example (Fig. 6), where the gathering in reminds us somewhat of a present-day tendency. The headdress of Lady Alice is an example of the *mitred* variety, reminding us strongly of the folding of some modern serviettes. This example is embellished, probably, with jewels.

Lady Vernon's effigy at Tong, Salop, also shows this peculiar detail.

A rather rough brass, probably of local origin, is that of Elizabeth Fitzwilliam at Sprotborough, Yorks (Fig. 6). It is, perhaps, just as well to consider this in connection with Fig. 10, a very fine example, which represents

Eleanor de Bohun, Duchess of Goucester, whose husband was arrested by order of Richard the Second, taken to Calais, and smothered (1397 A.D.), or, as was reported, died of apoplexy. His widow retired to a nunnery at Barking; hence she is shown here in nun's dress. The cloak, gown, hood, and wimple are seen in

11 12

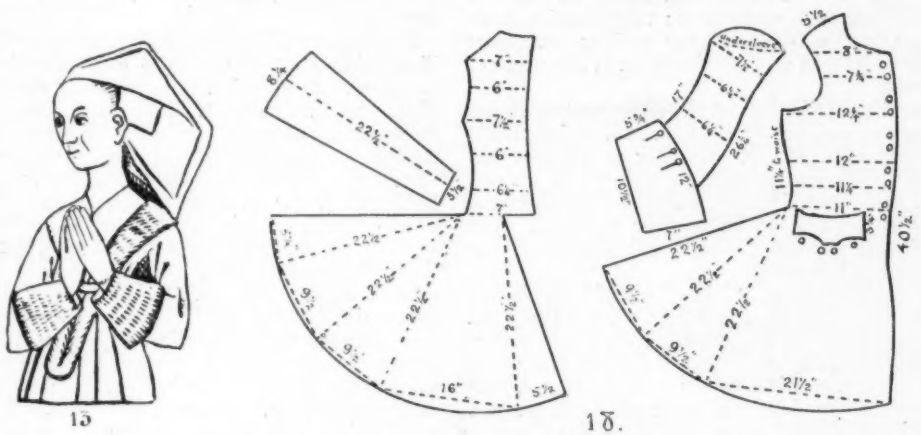
both Figs. 6 and 10, but the refinement of detail and material, and also the level of the wimple, are in decided contrast to the coarser material and work of Fig. 6.

Very interesting and unusual is the brass of Joice, Lady Tiptoft, on the top of a tomb in Enfield Church, Middlesex, 1446 A.D. (Fig. 7). Over a sideless *cote-hardie* and a kirtle this lady wears a mantle, embroidered with the arms of her parents, the large lion to her right being that of Edward Charlton, Lord Powis, and the three lions *passant gardant* to her left being those of her mother's father, Thomas Holland, Earl of Kent. This robe is secured by cords similar to those seen in Fig. 10. Planché says, in his *Dictionary of Costume*, that the "cote-hardie is presumed to be a close-fitting body garment buttoned all down the front, worn by both sexes in the fourteenth and fifteenth centuries in France and England, and has never been positively identified. Cote-hardie of men just covered the hips, having a military belt over. Those of ladies varied in length. Some reached the ground, others came below the mid-leg, but all fit closely as possible." Lady Tiptoft's appears to have reached considerably below the waist and to have been trimmed with ermine, as was the kirtle over which it was placed. The headdress is of the heart-

14 15

shaped variety. Golden network probably confined the hair, a small headtire or veil covered the top and back, and a curved coronet rested on the veil.

A lady of the upper middle class is shown in Fig. 8, which is from a brass, only 22 inches long and of rather inferior workmanship, dated 1582. The cloak in this



13 16.

case is left open in front, has openings for the arms, raised and perhaps slashed shoulders, and long pendant half-sleeves, which possibly were occasionally caught up round the arms by points or laces. Other things which should be noted are the ruff collar, the separate bodice, and the characteristic headdress (a variety of the French hood), which was very fashionable at that time.

16.

17.

A very fair idea of the costume of Henry the Seventh's reign can be gained from Fig. 9, which shows the very striking headdress, the *pedimental*, a kind of bonnet of velvet, diamond or kennel-shaped, having long frontlets of lappets, richly embroidered, hanging on either side of the face. Later these lappets were pinned up in side loops, as seen in some of Holbein's pictures. The gown is cut square at the neck; there is a rich girdle with a pendant, a feature of the period; and more details are to be seen at the wrists than in any other of our sketches.

Two small rough brasses of the latter part of Henry the Seventh's reign are Figs. 11 and 12, which should be compared with Fig. 9, especially to see how the fashionable girdle and pendant is replaced by an embroidered band worn similarly, and how the pedimental headdress is worked out in cheaper materials. The large, pointed, turned-back cuffs and collars are the chief features of the dresses.

Our next sketch (Fig. 13) is of a small half-figure, 8¼ inches high. The head is turned sideways to show the folding back of the headdress, known as the butterfly, fashionable in the brief reign of Richard the Third. The hair was confined in a cap or caul of gold net, projecting horizontally from the back of the head, and covered with a kerchief of fine texture, stiffened out to resemble wings. Some of the kerchiefs were transparent, and others were checkered with gold. The gown has a wide, turned-back collar, trimmed with fur, which reaches below the waist, and wide fur cuffs.

Two sketches of the effigy of Elizabeth Fineux are Figs. 14 and 15. This lady was the wife of Sir John Smythe of Ostenhanger, Kent, and his effigy faces that of his wife on their monument in Ashford Church. Her hand rests on a skull, showing that she was dead when the monument was ordered. By the aid of these two sketches the doll, photographed as Figs. 16 and 17, was dressed.

It is suggested that dolls should be dressed in schools, illustrating some of the most characteristic historical costumes. A collection thus gradually acquired would simply be invaluable in history and drawing lessons. There is no necessity to select elaborate and costly dresses, for there are several simple examples even in our short series of illustrations, and many could easily be found in our churches and museums. The choice of colour and material would form valuable exercises. For this doll finely-ribbed cream-coloured silk was used, lined with bright yellow.

In conclusion, one cannot help thinking what a vast amount of interest would be created and information disseminated, to say nothing of a certain amount of good fellowship brought about, if teachers were to rub the brasses of their districts and exchange rubbings with one another. Although the organisation of such a thing is a very complex matter, it certainly is not out of the power or the province of the National Union of Teachers. Failing this, we leave it to the consideration of our genial editor and our enlightened readers.

EDUCATIONAL HANDWORK.

AN EXPERIMENT IN THE TRAINING OF TEACHERS.

(From a Paper read before the British Association.)

BY J. TIPPING, SUPERINTENDENT OF MANUAL INSTRUCTION AND DRAWING, BRADFORD EDUCATION AUTHORITY.

[Mr. Tipping commenced his paper by describing the work done at the Scarborough Summer School.]

THE need for mind training through muscular activities has been urged by educationists in all times, and we consequently put aside any claim to originality in the movement in which we are actively engaged; but we do take due credit to ourselves for the inauguration of an experimental institution where facilities are offered to teachers of every grade to make themselves proficient in any phases of manual activity which in the light of present-day experience can be made to serve well-defined educational ends.

It might be suggested that the fruits of our labour are not very greatly in evidence, considering the years of enthusiastic work that we have put into it. I would, in reply, venture to assert that within the last few years there has been a distinct awakening in this direction, and to-day there can be felt the influence of a powerful educated public opinion working in support of the principles the value of which we are demonstrating in practice.

It has been aptly said that the Board of Education do not form public opinion, but rather take their cue from it. If that be so, we have a marked indication of the trend of educated public opinion as evidenced in a publication of the Board of Education just issued, which deals exhaustively with the problem of handwork in elementary schools. This is a most illuminating document, in so far as it gives very clear and definite indications of the marked change in the attitude of the Department to this aspect of education.

Therein will be found laid down in unmistakable terms the view of the powers that be as to the place that handwork must hold in all future educational effort.

In the past the chief difficulty which militated against the success of the movement lay in the fact that those who had the responsibility of administering education failed to appreciate the psychological aspect of the problem.

There never has been any marked antagonism to handwork in its outward expression, for to the average Briton practical handwork has always held a sort of fascination; but it is only slowly and with great difficulty and much doubting that the untrained mind can be brought to appreciate that the means we adopt to aid brain training are not the ends in themselves. For over twenty years the fight in handwork has centred round this misconception of its ultimate purpose.

Although the Froebelian principles have been generally adopted in the infants' schools, the fact that the spirit of the work has never until quite recently been developed further in any marked degree is sufficient evidence that the principles were never generally understood.

As a striking evidence of this there exists to-day in almost all our schools an intermediate stage of a child's schooling quite barren of all but abstract book instruction, yet at the end, in many cases, is developed an elaborate manual training in wood and such like—a scheme, mind you, not originally introduced for any truly educative ends it might serve, but for its industrial and vocational value alone.

To Herr Salomon, the founder of the Nääs Sloyd Institution, we are indebted in great measure for bringing the western world to a right understanding of the educational value of the higher forms of manual training, and it was certainly directly owing to his influence that our association was founded.

From the very beginning, under the guiding and inspiring influence of our president, Mr. Acland, the Educational Handwork Association has striven to give such opportunities for training to students that they could use manual training in its fullest educational significance in connection with the development of the child at all stages of its school life, and not only at the two extremes already referred to.

In season and out of season we emphasise the fact that manual instruction as an industrial training has no place in the ordinary school curriculum, but as a factor in mental development its presence is essential.

Briefly epitomised, the purpose of our summer school, in any and all the departments referred to, is to train teachers to utilise, in the truest Froebelian spirit, a variety of tools and materials, and to adapt them to educational ends. The more materials we use and the greater the variety of operations involved the better, for each has its characteristic influence in moulding the plastic mind and strengthening the executive faculties.

In developing the schemes taught in the various departments, the central idea has necessarily been to give due consideration to the two all-important points of view—namely, the technical and psychological.

So far as children are concerned, the latter is essentially of primary importance, whilst technique, as such, takes only a very secondary place; but from the point of view of the teachers themselves a full knowledge of the psychological aspect of the case must be coupled with sufficient technical skill to enable them to secure in the fullest sense the truest expression of the child's thoughts in material, in consonance with its age and executive skill.

Reference to the schemes of work on exhibition will emphasise the fact that, whilst the technical courses provide for the development of the executive powers, every opportunity has been taken of developing suggestive ideas for the application of such knowledge to the children's needs. Indeed, power to initiate such schemes as will apply to the varying capacities of the children is what is aimed at rather than the following of set schemes which, slavishly followed in the training school, would only tend to depart still further from the ideal when weakly imitated in the more restricted school circle.

In the kindergarten, of all places in the school, psychology plays an all-important part, and in our summer school this is kept constantly in mind. A daily lecture is given, followed by a general discussion, when the various forms of manual expression are discussed from the standpoint of child psychology.

For instance, in clay modelling, what children are interested in making, and the methods they would adopt in the making of such at different ages, is discussed and taken into account in working out the course, and the

all-important consideration of the psychology of touch is appealed to in discussing and determining the methods to be adopted in handling the material.

In like manner, in working out a brush-drawing course, the statistics with regard to children's ability to discriminate colours are appealed to. Samples of children's own spontaneous work are examined, and the

(*Continued on page* 334.)

COLOUR ARRANGEMENTS.

BY AGNES E. FARMAN.

THE teaching of colour is still in a more or less experimental stage, though its importance is recognised by all teachers. An appreciation and a good judgment of colour are most valuable assets to both masters and workmen in many trades, such as lithography, stained glass, pottery, painting and decorating, dyeing, and the manufacture and decoration of cotton, silk, and woollen fabrics. They are equally important for the buyers of these goods.

The accompanying exercises are intended to help scholars to see what beautiful combinations of colour are found in Nature, and to show how such schemes may be used as a *basis* for colour arrangements. It must not be taken for granted that they will invariably work out in a satisfactory manner, but they give the pupils suggestions as to what colours are likely to combine well, instead of allowing them to dip at random into a colour box. The schemes derived from these natural objects may be varied as their knowledge of colour increases.

Colour lessons, like all others, should be in progressive stages, according to the comprehension of the children. The exercises here given form one step only, and should not be taken till they have a fair knowledge of the colours in their boxes and the combinations that will be produced by mixing them.

For a preliminary exercise any two colours may be used from the paint box, and as many hues as possible shown to illustrate the blending of one with the other. For instance, crimson lake and Prussian blue may be chosen. At one end is the pure lake, which, by a careful mixing with blue, is graduated through a range of purples to pure blue at the other end. This exercise may also be utilised to show how a secondary colour is not simple, how purple may range towards blue on the one hand or red on the other, and examples from Nature may be elicited from the class to illustrate these differences. For instance, purple grapes are often on the red side, while a purple pansy is on the blue.

The next step is to select something with a simple range of colours, in which the primaries and secondaries predominate in a very definite way. This is to be found in a stick of rhubarb at certain stages. In these exercises no attempt is made at light and shade; the object should therefore be placed with the full light on it, so that it may not be disturbed by any shadow. The attention should be wholly devoted to matching the colours as nearly as possible.

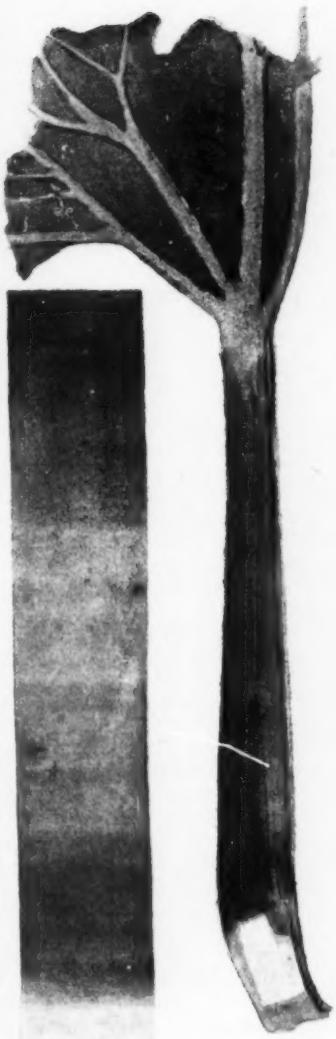
After the drawing has been made, a panel is ruled out in whatever direction best shows the range of tints, and in this the first attempt at colour is made. Any errors in mixing may in this way be corrected before the colour is put on to the actual drawing, the pupils' attention at first being concerned with that alone, and not distracted by the form of the object. The colour is next washed over the drawing.

Anything may be used for such exercises—flowers, leaves, fruits, vegetables, shells and stones, feathers, butterflies and moths, insects, etc.

At the foot of the page of illustrations are reproductions of two pieces of material the designs on which contain respectively the colour schemes found in the rhubarb and turnip. While it need not be supposed that the designer of these fabrics deliberately used these or other natural examples as a basis for his colouring, they serve to show that for almost every good colour design we find an equivalent somewhere in Nature. As it is there we look for the greatest beauty in line, so it is there we must look also for the finest schemes of colour; and the understanding and analysis of Nature's colouring must form an important part in our course of teaching, the value of which cannot be overrated in our efforts to cultivate an appreciation of beauty in our pupils. There are probably among them some of those designers of the future with whom it will lie to make the homes of the next generation beautiful or ugly; and if they learn to follow the guidance of Nature, we may hope to avoid the jarring and inharmonious colours which are so often an eyesore at the present day.

EDITORIAL NOTE.

WE have great pleasure in giving the greater portion of Mr. Tipping's paper recently read before the British Association at Sheffield. The mere fact that this select and august assembly recognises such a thing as educational handwork is in itself a proof that the cause is gaining ground. In selecting Mr. Tipping to give an address, the Association also showed that it was in touch with the best exponents of modern ideas on the subject. Mr. Tipping is no mere theorist. His daily work at Bradford, and the month's hard labour at the Scarborough Summer Course, tend to keep his ideas severely practical, and such as can be worked out in the ordinary school. Some day education authorities and others will find out what they owe to the pioneer work of these summer courses. From personal experience we know the arduous work that has to be done, not only while the course lasts, but all the year round. The Board of Education is entirely sympathetic towards handwork in schools; but, as we have pointed out before, it takes money to carry out any of these practical subjects, and grants-in-aid should be made. Further, teachers and inspectors must be convinced of the educational value of handwork. Of the children there is no doubt. Handwork is always a most popular lesson; and if teacher, inspector, and Department each do their share, the work is bound to succeed.



Exercises in blending one colour into another

Materials with the same schemes of colour as the rhubarb and turnip

students are trained to analyse them, estimate their value, and take hints for future guidance from them. Similarly, in drawing and paper-cutting the psychology of the perception of distance and third dimension in objects is worked out, and the children's powers in these directions at kindergarten age discussed.

Again, in dealing with the occupations of sewing and weaving, the mechanism of visual adjustments is reviewed and made the basis for criticism of the use of such materials as are utilised in mat-plaiting and the use of calico for sewing by young children; so that the students are given sound logical and scientific reasons why, in the case of very young children, sewing should be on coarse materials and with coarse thread, and why, as a substitute to the eye-straining mat-weaving, weaving with wool and raffia are so much more superior.

The teachers are led to see that the school occupations might readily have their inception in and be easily made extensions of the child's natural and instinctive home activities. He loves to build, thread beads, draw with pencil and chalk, use colour, and so on; and the teacher is trained to develop and enrich this play instinct by unconsciously guiding the child in the proper use of the various modes of self-expression in the ordinary school training.

The first principle of the kindergarten work is to get rid of the idea of courses in different material, and in its place to give the child ample opportunity to use a variety of materials to express itself, and to enable it to develop, in its own limited environment and to its own uses, the heritage of past experiences of the race.

The students in our kindergarten classes soon realise the fact that handwork is an essential factor, that it acts as the connecting link between the child's inner self and all outward manifestations. Through spontaneous self-activity the child develops every side of its nature in its efforts to express in material form its immature conceptions.

There is no place in such a scheme for set subjects in water-tight compartments, for the child's activities compass all. Number, speech, geography, and such like, are all touched upon, and become part of the child's equipment in a better and more real way than formal abstract instruction could possibly ensure.

It is in the full appreciation of the comprehensive sufficiency of the Froebelian principle, when properly worked out, that we endeavour to lead our students to discover the keynote to future development in the training of children in the transitional stage between the kindergarten and the upper standards of our senior schools.

To me it is a healthy and encouraging sign that this year, out of a total of 270 students, 70 have taken the kindergarten course—many of whom, mind you, are not infants' school teachers—and over 100 others have come to us to help them to bridge the intermediate stage; and this we have done by developing and adapting the kindergarten occupations to suit the increasing strength and broader mental outlook of the children.

A cursory examination of the suggestive schemes on view will illustrate the transition and development in the use and manipulation of such materials as clay, paper, cardboard, light wood, colour, and weaving materials. In the use of these media it will be noted that the aim has been to direct the child's activities into suitable channels, with a distinct view to his ultimate mental development in its broader sense, and with a clearer and more obvious connection than hitherto to the ordinary subjects of the school curriculum. Beginning with the home or school environment, the child's first lessons in history, geography, and such like, are elaborated in material form; and in order that our students shall appreciate the child's attitude in the fullest possible way, we put them through similar experiences. Dividing the class into groups, they are sent to visit, survey, and make notes of various points of local interest from a geographical or historical point of view, such as the Castle Hill, the Marine Drive, Oliver's Mount, the Bay, Cliff, and Old Town. On their return they are required to represent these places in clay, card, and other materials; and in doing so they discover in their own .experiences, to the full, the greater joy and sense of power which comes to the child with the actual accomplishment of a lesson worked out as a reality, as against the same lesson memorised only as a tale that is told. To the students it comes as a revelation how helpful such exercises as these are, not only in assimilating geographical and historical facts, but in developing each child's point of observation and individual expression, and also the use to which such exercises can be put in giving children whose word expression is most limited a means of extending and elaborating their vocabulary.

It is an interesting study to follow closely the various stages in this transition, from the point where the interest centres round the play instinct to the final consummation as illustrated in our advanced work, where the realities of life and its responsibilities are beginning to be seriously appreciated.

In the higher cardboard modelling, plain needlework, woodwork, and metalwork classes a well-defined progress is observable. Our students are trained to utilise these materials in a way still associated with their school subjects, but the mode of approach is materially different.

At the time when these manual activities are utilised in the school the pupils are better able to see the purpose of handwork in a truer perspective, and in the light of their past experiences, coupled with a clearer insight into the ultimate purpose of education; they are better able to discipline themselves, and thus aid the teacher to utilise these subjects to the best psychological and technical advantage.

From the artistic point of view all the subjects of instruction receive careful consideration. From the very beginning the æsthetic side of the teacher's nature is appealed to. In the modelling and drawing classes, in addition to receiving instruction in technique, the students are trained in artistic appreciation; also in the art needlework, wood-carving, and repoussé metalwork classes the students who have previously developed executive skill in the related crafts are, through the medium of these decorative arts, instilled with an interest and appreciation of the fundamental principle of art as applicable to the particular form of expression they have elected to study.

In concluding, may I say that the school I have described is, during its brief annual existence, a busy hive, or rather laboratory, where the students, under the guiding influence of the staff, are by direct experimentation solving the problem of how to use educational handwork as a method in the fuller interpretation of what should be understood as a general education.

When this time arrives, the Educational Handwork Association will, I am sure, be prepared to gracefully retire from this sphere of activity, in the satisfying knowledge that its pioneer efforts have not been in vain.

DIRECT BRUSH STUDIES IN BLACK AND WHITE.

NELSON COLOUR BOOKS

THE LAND AND THE BOOK.

By Dr. W. M. THOMSON. A New Edition of the most popular work on Bible Lands and Customs ever published. Revised by JULIAN GRANDE, F.R.G.S. This has always been an immensely popular Gift Book, and this New Edition should make it more popular than ever. Twelve specially-painted Coloured Pictures. **Price 6s. net.**

Specimen Illustration from "The Gateway to Tennyson."

MEN OF MARK

IN THE HISTORY OF WESTERN EUROPE.

A gossiping introduction to General History. By RICHARD WILSON. Suitable for both Boys and Girls. Thirty-two striking Coloured Pictures from the galleries. **Price 6s. net.**

THE GATEWAY TO TENNYSON.

A delightful introduction to the works of the great poet. Containing stories from the "Idylls" and "Becket," extracts from the longer poems, and a choice selection of shorter pieces. With a charming biographical introduction by MRS. ANDREW LANG. Numerous Coloured Plates—Marginal Illustrations. **Price 6s. net.**

STORY OF A BRAVE CHILD.

A children's life of Joan of Arc, simply written from the old romantic records. With coloured frontispiece after Sir John Gilbert, and eight plates in monotone after famous French artists. **Price 3s. 6d.**

FOR LOVE AND HONOUR.

By DOUGLAS C. STEDMAN. A series of romantic stories in a historical setting, and arranged in chronological order. Full of spirit and action. With Thirty-two beautiful Coloured Plates. **Price 3s. 6d.**

THE MILK-WHITE THORN.

A Book of Fairy Tales from various sources, simply told for younger children. With Thirty-two Coloured Plates and numerous Marginal Illustrations. **Price 2s. 6d.**

THOMAS NELSON AND SONS, London, Edinburgh, Leeds, Dublin, and New York.

"The Practical Teacher" Technical Scholarships

The Proof of the Pudding.

THE Editor recently spent a profitable half hour in glancing over the work of one of our Scholarship holders who has completed his course of study in Book Cover Design under the International Correspondence Schools. He was much impressed by the carefulness and thoroughness of the instruction which had been imparted; and, knowing a little about the commercial possibilities of the work, could see quite clearly that the student in question would, in due time, be able to offer his designs for sale to publishers. This is one of the characteristics of work at the International Correspondence Schools. It is frankly useful, and aims at helping the student to obtain the means of living, and to fit him for improving his chances in the fierce battle of modern life.

I.C.S. Language Courses.

The Phonographic Method of teaching Foreign Languages adopted by the International Correspondence Schools seems to be very popular with our readers. Before the issue of the Christmas Number of "The Practical Teacher" (ready November 25, of all booksellers), the Editor means to make a personal, practical trial of the method, and will relate his experiences in an article to be entitled "The French Professor—New Style." Possibly we shall live to see the International Correspondence Schools taking advantage of the aeroplane to spread technical education in our benighted country.

A New Scheme.

Those of our readers who have already benefited from the Courses of the International Correspondence Schools will be interested to learn that the Editor is at the present moment engaged in negotiations with the Schools, with the object of affording further help to those teachers who wish to keep themselves in the van of the educational army. The reform of the school curriculum in the prac-

tical direction proceeds apace; but teachers in all parts of the country are finding themselves in a quandary as to what is really required of them. We can, of course, put the matter in a nutshell by telling them that the modern teacher will continually ask himself, "How far is this lesson going to help my pupils to get into touch with the living, moving—we had almost said flying—world of to-day?" But this does not afford much practical help.

Applied Knowledge.

What is really required is, that the teacher should study a few technical subjects from the point of view of practical utility. We guarantee that a course of work with the International Correspondence Schools under our Scholarship Scheme will act as an eye-opener to many a teacher who has been been brought up on the text-book method of our schools and colleges. Here is an institution which, like Bacon, takes all knowledge as its province, but will have nothing to do with useless information. After all, in spite of the *quidnuncs*, this is the only possible educational method of the modern world, where the sum of human knowledge is overwhelming and rigid selection is necessary, if the accumulation of physical facts is not to prove an incubus. We must lighten the ship in some manner, and the International Correspondence Schools has learnt the manner to perfection. Let our readers put this to the test.

OUR OFFER OF FREE TECHNICAL SCHOLARSHIPS IS STILL OPEN.
See "The Practical Teacher" for October.

A Word to Our Scholarship Holders.

The Editor is delighted to receive the ungrudging testimony of those students who have written to him expressing the high appreciation of the manner in which our Technical Courses are conducted. He will be glad to hear from others who have completed their studies, and earnestly recommends all those who have done so to make every effort to apply the knowledge they have gained in the schoolroom, and if possible to go into the works of their own district and find out how things are done. There is a great future before our schools if they can throw off the red-tape influence of the Central Department. They ought to be hives of living industry—without drones—instead of museums of fossilised intellects, filled with specimens of officially-stunted development.

OUR PHOTOGRAPHIC COLUMN.

THE ACTION OF THE LENS, AND THE MOVEMENTS OF THE CAMERA.

BY THOMAS A. BRIGGS.

IT is the general rule for a beginner to purchase a box-form or "hand" camera as a start. This is rather putting the cart before the horse, for the field or "stand" camera teaches you how to perceive the difficulties of picture-making on the ground-glass screen before the plate is exposed.

The box-camera does not do this, and as it has practically no movements to speak of, I will confine my remarks to the former type, and will take the action of the lens first.

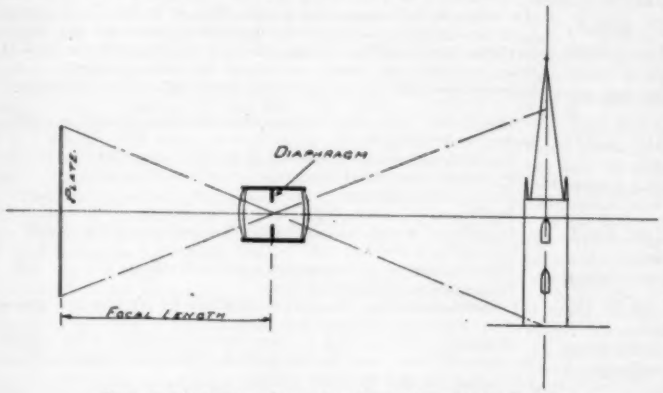


FIG. 1.—SHOWING LENS OPPOSITE CENTRE OF PLATE.

The camera itself is only a dark box, and the most elaborate movements are but the muscles of the "eye." The lens is the "eye;" and if it is imperfect, or used improperly, you can never hope to get a presentable print. The variety of lenses made is very large, but I will speak of only two kinds here—the single or "landscape" lens, and the rapid rectilinear, or "R.R." The single is still largely used in cheap cameras, and is a perfectly capable instrument, albeit rather slower than the R.R. It has the diaphragm, or stop, in front of the glass generally, and is mounted in a simple brass tube. The defect of this type of lens is a tendency to make straight lines appear curved. The photograph of a square window will often appear cushion or barrel shaped, according as the diaphragm is in front or behind the lens. Apart from this distortion, which, if the lens is a fairly long-focus one, is quite negligible, the single lens is a very useful tool.

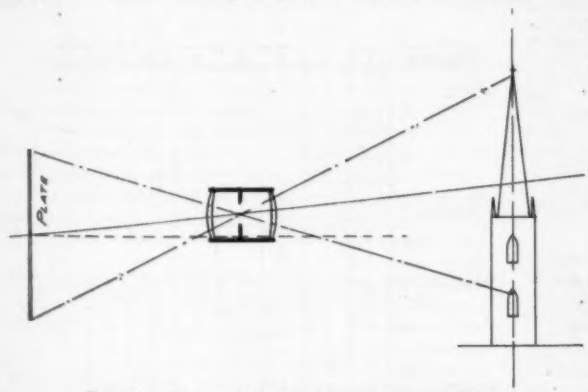


FIG. 2.—SHOWING EFFECT OF RAISING THE LENS.

By combining the two single lenses together thus ( ), we get the R.R., in which the cushion distortion of one glass counteracts the barrel distortion in the other. This produces rectilinear lines. The diaphragm is then placed midway between the glasses.

Now we come to the very important question of the diaphragm or stop. This is a variable-sized hole, usually worked on the principle of the iris—that is, by moving a small lever or knob, little plates close inwards and reduce the diameter of the hole.

You will see that numbers are marked on the lens-jacket, thus: F/8, F/11, F/16, and so on. This means that the *diameter* of the hole is one-eighth, or one-eleventh, or one-sixteenth of the focus of the lens. It is a most useful way of marking, because it gives us an exposure standard for any lens, of any focus. It is most important to remember that *all* lenses working at F/8 necessitate the same exposures (other things being equal, of course).

Now, we know by simple arithmetic that the area of a circle is proportional to the square of the diameter, therefore F/16 is one-quarter the area of F/8.

$\frac{1}{8} \times \frac{1}{8} = \frac{1}{64}$, and $\frac{1}{16} \times \frac{1}{16} = \frac{1}{256}$.

Consequently the amount of light passing through is proportional to the area of the hole.

Now you will wonder why we have to use F/16, when F/8 would be four times faster or require one-quarter the exposure of F/16. This brings us to the question of "covering power" of a lens. Set up your camera and focus on a near object—say a post at ten feet away, using the F/8 stop—when you will find that a steeple in the distance is quite blurred. Move the knob of the iris round to, say, F/16, and you will find that both objects are now quite sharp. By "stopping-down" you have increased the "covering power" of the lens.

Another use of stopping-down is to diminish the amount of light acting on the plate when necessary. For instance, you wish to give a quarter-second exposure. This cannot be done by hand very well, so you stop down from F/8 to F/16 and give one second, which is quite an easy matter.

Now we will turn to the movements of the camera.

The base-board is provided with a rack and pinion for altering the distance between the lens and plate (the focal distance). If, say, a far distant object is in sharp focus at 9″, an object at 6′ away requires the lens to be racked out to about $10\frac{1}{2}$″.

The front of the camera on which the lens is carried has a rising and falling front. This is most useful, as it allows us to include the top of a building, etc., on the plate, while keeping the camera still and the focussing screen vertical. One of the most important points for a beginner to remember is always to keep the screen vertical; otherwise the doors and windows of a building will have a taper appearance, something like Egyptian architecture.

A spirit-level or a plumb-level fitted to the back of the camera is a very useful accessory. In certain cases the back is set out of the vertical, but this will not concern you at present.

There is no difficulty in placing the camera vertically sideways, as the lines of a picture will soon show on the screen if at all "skew."

The rising front, then, is a means of shifting the lens in relation to the screen. The box-camera, not having this movement, is at a disadvantage, for the temptation to tip it upwards is very great. Taper-lines in a negative can be made square on the print, as I shall show in a forthcoming chapter on enlarging; but it is much better and more workmanlike to obtain a true picture first.

The cross-front is fitted to some cameras, but it is used very occasionally, though if the camera is of the pocket-folding type, it becomes a rising-front when the camera is turned over for a horizontal view.

The wide-angle movement is also occasionally useful; for when using a wide-angle lens—that is, a lens whose focal length is short in proportion to the length of plate—a large amount of the landscape is included on the plate. If now the front of the camera were racked back to the short position required, the baseboard might possibly be shown in the picture. So the back of the camera is made movable forward. This is most generally used in architectural photography.

This movement (W.A.) is not fitted to the light hand-stand type of camera intended for the pocket, but only to the field type. By the hand-stand type I mean those pocket cameras whose baseboard folds up to the back, and forms a cover to the lens and bellows.

The turntable fitted in the baseboard is a swivelling device to allow the camera to be turned in any direction after the tripod is set up, and its use is obvious.

The swing back is a handy movement for certain landscapes and for portraiture. It provides a means of throwing the plate definitely out of the vertical plane. One of its uses is to obtain sharp focus on the face at the same time as the hands, in the portrait of a person sitting down. The hands will probably be nearer to the camera than the face is, and consequently "fuzzy." By tipping the top of the screen backwards, the hands may be rendered sharply. This, however, is a movement which need not trouble a beginner.

The reversing back is to allow either a horizontal or a vertical picture to be taken after the camera has been set up.

The above details may seem rather dry to read, but I should advise you to digest them carefully. By understanding a few of the simple principles of the lens and its movements you will save many a plate which otherwise would be a failure.

(To be continued.)

Practical Arithmetic: Examples and Exercises. By R. S. Osborne. (Effingham Wilson. 257 pp. 2s. 6d.)

This book is written for students who have acquired a knowledge of the elementary rules and wish to take up the business side of the subject. Special attention has been given to commercial insurance, interest, shares, etc.

The section on the solution of problems in compound interest and annuities by lorgarithms is especially well done, and all commercial students will profit by reading the excellent chapter on exchange calculations. We can strongly recommend this book to students preparing for the examinations of the Institute of Bankers and the Chartered Institute of Accountants.

A NEW COURSE OF PRACTICAL AND CONSTRUCTIVE WORK,

ARISING OUT OF AND COMBINED WITH THE ORDINARY SCHOOL SUBJECTS.

For Junior, Middle, and Upper Divisions of Primary Schools.

BY A. R. PICKLES, M.A., AND DALTON GRANGE.

[*N.B.*—By inadvertence the number of Lesson 46 was omitted in the October issue. On p. 280, second column, the lesson on "Graphic Arithmetic" should be numbered as Lesson 46.]

GENERAL SYLLABUS FOR SENIOR DIVISION.

COURSE III.

UPPER CLASSES.

[In response to numerous requests, Messrs. Pickles and Grange have forwarded in advance the general syllabus for the Senior Division, which we have pleasure in publishing for the help of those teachers who desire to submit the complete syllabus for approval by H.M. Inspector or the Local Education Authority.]

The circle: radius, diameter, circumference, chord, segment, sector, area, designs.

Angles as sectors: construction of angles; protractor and its use.

Pyramid, square and triangular: volume of pyramid.

Hexagon and octagon.

Further exercises on the right-angled triangle.

Drawing of square half or double the *area* of a given square.

The cylinder and the cone.

Plan and elevation: exercises and illustrations.

Proportionate division of lines.

Concentric circles: borders; exercises in planning of spaces and in calculation of area, cost, etc.

Measuring and drawing to scale of objects based on the regular geometrical forms, and the calculation of problems thereon which have been devised by the pupils.

Symbolic expression: simple equations and problems leading to simple equations, use of brackets, simple factors.

Use of squared paper for calculations, graphs, etc., especially in construction of graphs showing such relationships as between inches and centimetres, yards and metres, lbs. and kilos., francs and shillings, etc.

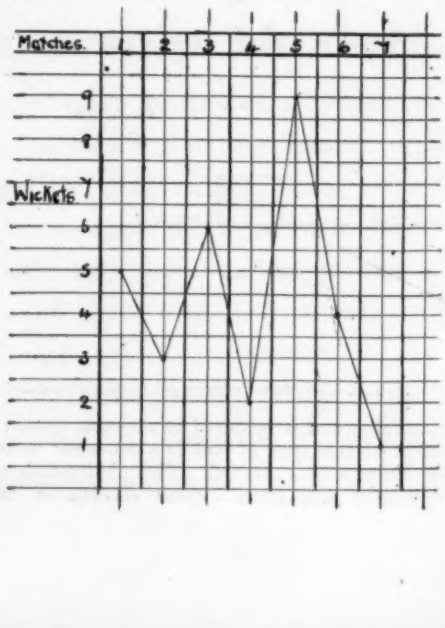
Modelling in cardboard and paper, based on previous geometrical relationships and exercises: fender, cradle, square pyramid, triangular pyramid, hexagonal prism and pyramid, octagonal box and tray, salt-box, stable lantern, etc.

Calculations and problems—numbers and letters—based on all drawing and modelling exercises.

MIDDLE COURSE.

LESSON 46 CONTINUED.—GRAPHIC ARITHMETIC.

A bowler at cricket obtains the following wickets in 7 successive matches: 5, 3, 6, 2, 9, 4, 1. Plot out these results.



(For the graph to look well, it is suggested that the dots be made circular in shape, and not too large, the lines thin. To guard the pupils from joining the wrong dots, the first line should be drawn as soon as the second dot has been placed, the second line when the third dot has been fixed, etc.)

Some Questions.

1. Plot out the following attendances made by a class in a week: 61, 54, 61, 56, 60, 55, 59, 54, 58, 57. (*N.B.*—The attendances are between 50 and 65.)

2. The following are the points obtained by a cricket team in the league in seven successive years: 34, 38, 35, 38, 37, 34, 40. Plot out these figures.

3. Plot out the following figures, which show the highest shade temperature during one week: 50°, 50°, 51°, 58°, 64°, 61°, 58°. (Place the figures of the next question on the same graph.)

4. The following figures give the lowest shade temperature for the same week: 32°, 31°, 47°, 39°, 44°, 45°, 48°. When completed, questions of the following type may be asked: On what day was there least difference between the highest and lowest temperatures? On what day most? When were the two temperatures lowest? etc.

5. Graph the following figures, which give in hundreds the number of vessels passing through the Suez Canal: 1902, 37; 1903, 37½; 1904, 42; 1905, 41; 1906, 39; 1907, 42½.

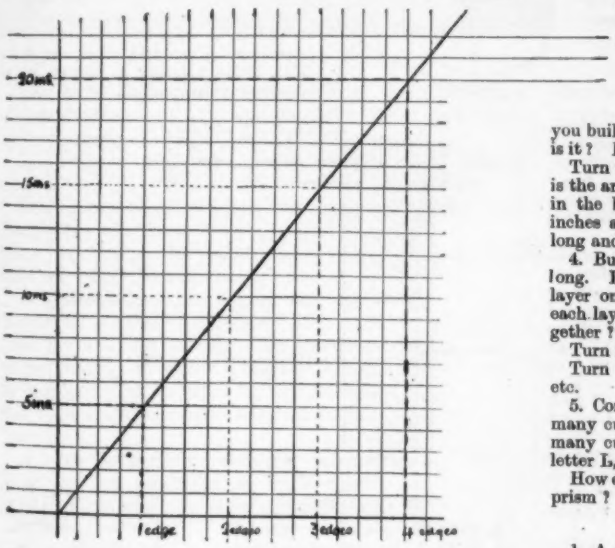
6. Plot out the following prices of shoes: Size 3, 3s. 9d.; 4, 4s. 1d.; 5, 4s. 5d.; 6, 4s. 9d.; 7, 5s. 2d.; 8, 5s. 6d.; 9, 5s. 9d.; 10, 6s.

7. Graph the prices of bolts given below, and say what you would expect to be the prices of bolts 4½ inches long and 5½ inches long: 3 inches, 5s. 3d.; 3½ inches, 5s. 8d.; 4 inches, 6s. 7d.; 5 inches, 8s.; 6 inches, 10s.

8. Plot out the prices of wrought-iron tubing given below: ½-inch diameter, per foot 4½d.; ¾-inch, 6d.; 1 inch, 8½d.; 1¼ inches, 1s.; 2 inches, 1s. 9d. What should be the price per foot of 1½ inches diameter and 1¾ inches diameter?

Graphic Arithmetic.

One side of a cube measures 5 inches. What is the perimeter of one face? (20 inches, or 1 foot 8 inches.)



Repeat this problem several times, taking one edge as represented by 3 squares, then by 5 squares, then by 6 squares.

Some Exercises.

(Set out on squared paper.)

1. What is the perimeter of a square when one side measures 4 inches? (16 inches.)

2. The long edge of a square prism measures 3 inches. What is the length of all the long edges? (12 inches.)

3. If the end of this prism is a 2-inch square, what is the total length of all its edges? (28 inches.)

4. One face of a cube has an area of 4 square inches. What will be the area of all its faces? (24 square inches.)

5. A square prism measures in length 6 inches, and its square end has an edge measuring 3 inches. Find—
   (*a*) The length of all its long edges. (24 inches.)
   (*b*) The length of all its short edges. (24 inches.)
   (*c*) The area of the oblong faces. (72 sq. in. altogether.)
   (*d*) The area of the two ends. (18 square inches.)

6. How many days are there in 3 weeks? (21.)

7. How many schooldays are there in 5 weeks? (25.)

8. Seven boys have how many thumbs? (14.)

9. Reduce 3 shillings to pence. (36d.)

10. A man walks 4 miles an hour. How far will he walk in 5 hours? (20 miles.)

Lesson 47.—Volume.

Note.—For this lesson the teacher will require a supply of inch cubes.

1. *The Inch Cube.*—(Each pupil to have one.) How many faces has this inch cube? What is each face? (square). Measure the edge of the cube. What length is each edge? What is the area of each face of the cube? Why do you call it a *square* inch? What is the length of the cube? the width? the height? What is the length of each edge? What do we call a square of inch side? Why? What shall we call a cube which has each edge an inch long? Write the word "cubic" on the blackboard. Why do we call it a cubic inch?

2. Construct a square of 3-inch side of these cubes. How many cubes have you used? Place another layer of cubes on the top. How many have you got now? Put another layer on. How many cubes have you used? What have you made? How many cubic inches in it?

What is the area of the bottom of this large cube? What is the number of cubic inches in the bottom layer? How many layers are there? How do you find out the number of cubic inches there are altogether?

(*N.B.*—The method: Area of base multiplied by the height is taken, mainly because, when the pupils come to the later stages—to the triangular prism, octagonal prism, cylinder, etc.—they more easily fall into the method of finding the volumes of these solids than when they are taught that volume equals length multiplied by breadth multiplied by height.)

Build up from the inch cubes a 2-inch cube. How many cubes in the bottom layer? How many layers? How many cubes altogether? How many cubic inches in a 2-inch cube?

Repeat with a 4-inch cube.

3. Construct a rectangle 4 inches long, 2 inches wide. How many cubes have you used? Place another layer on. How many cubes have you used now? What have you built? What is the area of the bottom or base? How high is it? How many cubic inches in it?

Turn the figure over so that it stands on a square end. What is the area of the bottom or base now? How many cubic inches in the bottom layer? How many layers? How many cubic inches altogether? Repeat, starting with a rectangle 4 inches long and 3 inches wide.

4. Build a wall two cubes wide at the bottom and five cubes long. How many cubes in the bottom layer? Place another layer on. Another layer. Another, etc. How many cubes in each layer? How many layers? How many cubic inches altogether?

Turn it over so that it stands on the end. Question as before.

Turn over so that it stands on one side. Question on layers, etc.

5. Construct a letter H flat on the table, using cubes. How many cubes have you used? Make it three layers deep. How many cubes have you used altogether? Repeat with letter T, letter L, letter E, letter F, etc.

How do you find the number of cubic inches in a cube? a square prism? etc. Introduce the word "volume."

Some Questions.

1. A cube has an edge measuring 5 inches. How many cubes of inch edge will be required to build one of similar size?

2. The bottom layer of a brick wall has 96 bricks. There are eleven layers of these bricks. How many bricks altogether?

3. A block of wood has a square end measuring 4 inches. How many cubic inches of wood in it if the wood is 7 inches long?

4. A chalk-box is 13 cm. long, 9 cm. wide, 9 cm. high. How many cubic centimetres is it equal to?

5. A trough 25 inches long, 10 inches wide, is filled with water to a depth of 8 inches. How many cubic inches of water in it?

6. A cube has an edge 1 decim. long. How many cubic cm. in it?

7. The edge of a cube measures 1 foot. How many cubic inches in it?

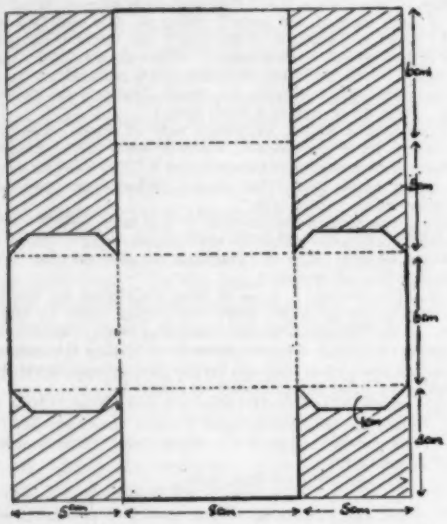
8. An oak gatepost is 6 inches square at the bottom, and 5 feet high. Find the number of cubic inches of oak it contains.
9. A cocoa-tin is 10 cm. high, 6 cm. long, and 4 cm. wide. Find its volume.
10. A plank is 2 feet long, 8 inches broad, and 3 inches thick. Find its volume.

Answers.

1. 125 inch cubes.	6. 1,000 cubic cm.
2. 1,056 bricks.	7. 1,728 cubic inches.
3. 112 cubic inches.	8. 2,160 cubic inches.
4. 1,053 cubic cm.	9. 240 cubic cm.
5. 2,000 cubic inches.	10. 576 cubic inches.

Lesson 48. Paper Modelling.—The Oblong Box.

Size of paper required: sheet of drawing-paper $11'' \times 7\frac{1}{2}''$ (about).



Draw as shown in the diagram. Cut away the shaded portion. Fold along the dotted lines as shown. (The ruler may be used as a support when gumming the flaps.)

1. How many faces has a cube? a square prism? this box? Why isn't this a cube? a square prism? Show a square prism. Why do we call it a square prism? What shall we call this box (oblong box or prism)? Why?

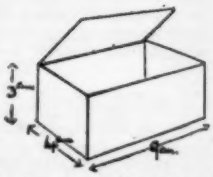
2. Show cube. What is each face of a cube? How do the faces of a cube differ from those of a square prism? How do the faces of a square prism differ from those of a rectangular or oblong prism? How many of the faces of a cube are square? of a square prism? of a rectangular prism? How many of the edges of a cube are equal in length? of a square prism? of an oblong prism? How many of the faces of a cube are equal? of a square prism? of an oblong prism?

3. Pupil in front of the class. Let him build a cube of two-inch edge on the table. How many inch cubes has he used? Let another pupil build another cube of the same size. Place the two cubes together, so as to form a square prism. What do the two cubes make when placed side by side? Allow pupils to build another square prism of the same size in the same way. Place the long face of the second square prism to the long face of the first square prism. What have we made?

4. Place the oblong box in front of you on the desk, the lid at the top, and a large oblong face in front of you. Number this face 1. Turn from left to right, bringing the end in front of you (Number 2). Turn from left to right again (Number 3). Turn again (Number 4). Which faces have you not numbered? Now tell me which faces are equal. (1 and 3; 2 and 4; lid and bottom.) What is the area of face 1? face 2? the lid? What is the total area of these three faces? (This should be worked as shown in the pupil's page.) Note that the length of each edge occurs on two separate lines. This suggests an accurate method of finding the area of all the faces of a rectangular prism. How shall we find the total area of all the six sides?

5. How many edges are 8 cm. long? 6 cm.? 5 cm.? Find in your book the total length of all the edges. See that the pupil works this out methodically.

Exercises.



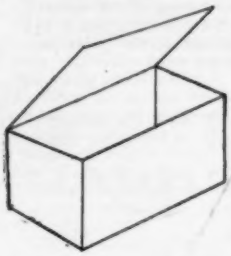
1. Construct an oblong box as per sketch.
2. Find the total length of all the edges of the closed box.
3. What is the perimeter of the largest face?
4. Find the perimeter of the smallest face.
5. What is the total area of all the faces of the box?
6. What is the difference between the areas of the largest face and the smallest face?
7. Find the area of the sides of the box without the lid.
8. What is the area of the lid and the side to which it is fastened?
9. What is the area of the bottom of the box and the two ends?
10. Find the number of cubic centimetres in the box.

How the Pupil's Page could be Arranged.

Face 1 = 8 × 5 = 40 square cm.	4 × 8 cm. = 32 cm.
Face 2 = 6 × 5 = 30 square cm.	4 × 6 cm. = 24 cm.
Lid = 8 × 6 = 48 square cm.	4 × 5 cm. = 20 cm.
118	76 cm.
2	
236 square cm.	

Answers.

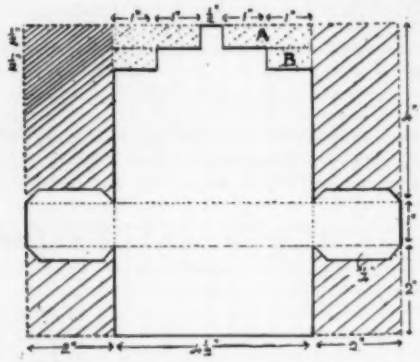
2. 64 cm.	5. 150 square cm.	8. 63 square cm.
3. 26 cm.	6. 24 square cm.	9. 60 square cm.
4. 14 cm.	7. 114 square cm.	10. 108 square cm.



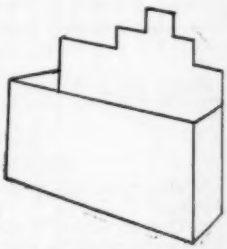
Paper Modelling: Brush and Comb Box, introducing the Half in Multiplication, and Volume.

Size of paper: ordinary sheet of drawing-paper.

Draw as shown in the diagram. Cut away the shaded portion, taking care to cut the dotted portion in the shape of four rectangles; these four rectangles to be put on one side for the mathematical questions. Then fold along the dotted lines, fixing together as shown in the accompanying drawing.



Some Questions.



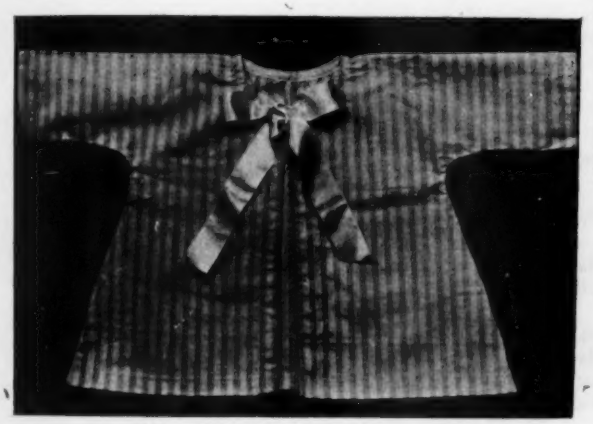
1. Find the area of the rectangle A. 2. Find the area of the rectangle B. 3. What is the total area of all the four rectangles cut out of the back of the box? 4. What was the area of the back of the box before these were cut out? 5. What is its area now? 6. Find the perimeter of the back of the box. 7. What is the area of the front of the box? 8. What is the total area of the two sides of the box? 9. Find the total area of the surface of the box. 10. Calculate the volume of the box.—*Answers:* 1. 1 sq. inch. 2. ½ sq. inch. 3. 3 sq. inches. 4. 18 sq. inches. 5. 15 sq. inches. 6. 17 inches. 7. 9 sq. inches. 8. 4 sq. inches. 9. 32½ sq. inches. 10. 9 cubic inches.

Our Needlework Column.

BY J. A. FLEMING, AUTHORESS OF "COMMON-SENSE NEEDLEWORK."

COMMON-SENSE COMFORTABLE CLOTHING FOR CHILDREN.

THE little garments described this month are suitable for a little one from a year or eighteen months old to four years old. They should prove acceptable to young mothers as well as to teachers, as they do not take much making, and yet are dainty in appearance.



A BABY'S ONE-PIECE JACKET.

This useful little jacket is well within the capabilities of girls in Standard IV., and can be cut out and made up by that class.

The little model was carried out in white wincey striped with pink, tied at the neck with pink ribbon.

The kimona sleeves allow the garment to slip very easily over the dress sleeves, which is a great advantage, as babies and young children greatly dislike being dressed.

It is very simple in shape, and there is very little making required. It is suitable for wearing as an outer garment, or for putting on under a cape or shawl. It is equally as suitable for a child who can walk as for one who sits in a perambulator.

A more dressy little coat for summer wear can be produced in such cotton washing materials as pique, muslin, and cambric.

These would be improved by insertion round the bottom and up the fronts, with a frill of lace or embroidery at the outer edge. As the lace and embroidery would add to the size of the coat, calculations must be made accordingly.

If composed of thinner materials, it would form a pretty little garment for making up by older girls.

Methods of attaching lace and embroidery to each other, and to raw edges, will be described later.

To draft the Pattern (Fig. 2).—Take an oblong of paper 36″ × 29″. Fold it across the middle to make it 18″ × 29″, as in the diagram.

Fold it three times across the top and open it out, and fold it twice down the side, pressing the creases well.

Lay it out flat, and mark the corners A, B, C, D.

From A mark E 3¼ divisions in.

From A mark F 4 divisions in and ¼ down.

From B mark G 3¼ in.

Draw a curve from E to G, passing through F.

From B mark H 4 in and ¾ down.

Draw a second curve from E to G, passing through H, to form the front neck.

From B mark J 1½ down and 1¾ in.

From D mark K ⅞ in and ⅛ up.

Draw the under-arm line from I to K, passing through J.

From C mark L ⅞ in and ⅛ up.

From A mark M 1½ down and 1¾ in.

From A mark N 1 down.

Draw the under-arm line from N to L, passing through M.

To make up the Garment.—One yard of material will be required, 30″ wide.

Lay the paper pattern on the child for whom it is intended, and lengthen or shorten it as may be deemed necessary. If the coat be too large, it is easy to reduce it by laying a pleat down the middle of the pattern before it is placed on the material, and by making both body and sleeves a little shorter.

Join the sleeve and side-seams by a run, and herring-bone. Tack a half-inch fold at the bottom of the sleeves, on the wrong side, and herringbone it. Tack also a one-inch fold round the bottom of the jacket, and herringbone it. The neck *can* be finished off in the same way, but it will be firmer and stronger if galloon be tacked over the raw edge after a narrow fold has been laid. The galloon must be eased at the shoulders. It is finished off by either hemming or running each edge. A yard of ribbon cut in two and sewn at the neck is the only fastening.

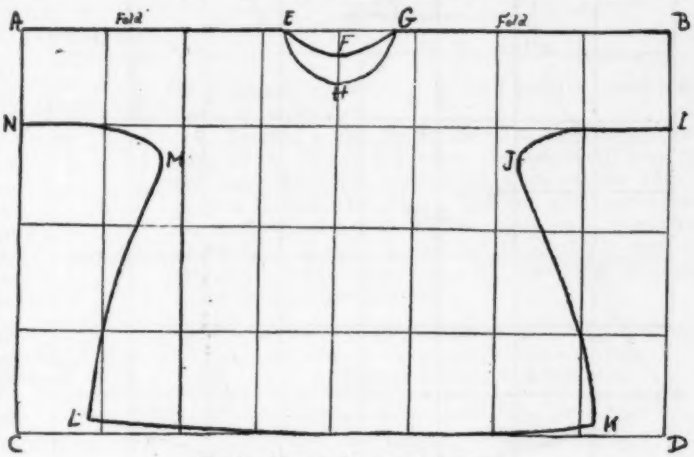


FIG. 2.—BABY'S ONE-PIECE JACKET.
18″ × 29″.

A Child's Princess Petticoat.

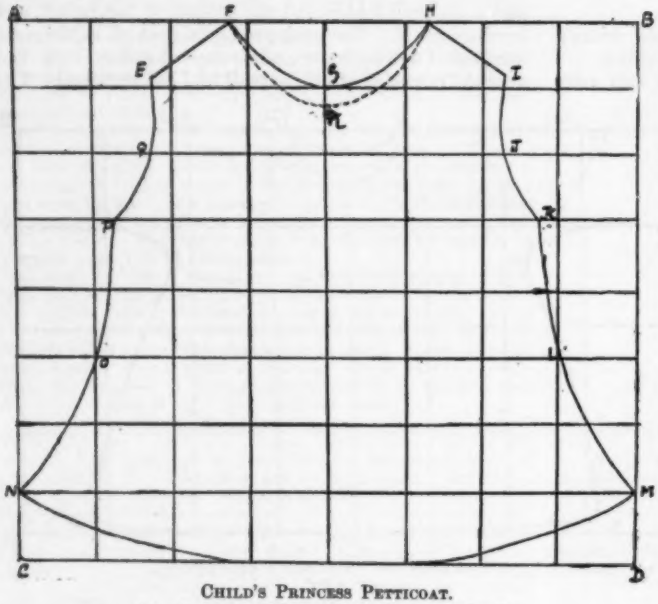
(2 to 4 years of age.)

Amount of Material.—Three-quarters yard madapolam, 1½ yards embroidery, 2 yards lace.

The model was a dainty little garment made in madapolam, having embroidery round the edge of the frill and Valenciennes lace round the neck and armholes.

Three-quarters of a yard would make one petticoat if the material were 40″ or 42″ wide. Cambric, madapolam, and fine calico are all suitable for summer wear. Wincey, nuns' veiling, or flannelette may be substituted for winter.

The back and front are both alike, except that the front is hollowed out ½″ more at the neck. This extra slope is indicated by the dotted line in the diagram. The petticoat fastens down the back.



Child's Princess Petticoat.
2 to 4 years. 17″ × 20″. Frill 1¼ yds. by 5″.

To draft the Pattern.—An oblong of paper 34″ by 20″ is doubled so as to form a smaller oblong 17″ by 20″. This is doubled three times lengthwise to produce eight divisions along the top. Crease it well, and open it out again as in the diagram. Double it three times in the opposite direction, when there will be eight divisions down the side.

Mark the corners A, B, C, D.
From A mark E 1¾ divisions in and ¾ down.
From A mark F 2¾ divisions in.
Join E to F by a straight line.
From B mark G 4 in and 1 down.
From B mark H 2¾ in.
Draw a curve from F to H, passing through G.
From B mark I 1¾ in and ¾ down.
Join H and I by a straight line.
From B mark J 2 down and 1¾ in.
From B mark K 3 down and 1¼ in.
Draw a curve from I to K, passing through J.
From B mark L 5 down and 1 in.
From B mark M 7 down.
Draw a curve from K to M, passing through L.
From C mark N 1 up.
Draw a curve from M to N, keeping the line straight for almost two divisions each side of the middle.
From C mark O 3 up and 1 in.
From C mark P 5 up and 1¼ in.
Draw a curve from N to P, passing through O.
From A mark Q 1¾ in and 2 down.
Draw a curve from P to E, passing through Q.

To form the Front Neck Slope.—From A mark R 4 in and 1¼ down.
Draw a dotted line from F, through R, to H.
Cut the front only out by the dotted line.
Cut 3½″ down the middle of the back from G to form the opening.

To cut out the Material.—Tear off two widths of material 5″ deep for the frill. Use as much as is needed to make the frill 1½ yards wide when joined.

Double the remaining material lengthways, so that the raw edges come top and bottom and the fold at the side.

Lay the pattern on to the material close to the selvedge, so that the "left-over" will be the double material at the side. The bias strips can be cut out of that spare piece.

Making up the Garment.—Join the shoulders and sides by the most suitable method for the material adopted, remembering that the smaller the garment and the finer the material the narrower and daintier must be the seams. A French seam is adapted for thin materials. A counter-hem, run-and-fell, or seam-and-fell is applicable for thicker ones.

Make a ¾″ hem on the right-hand side of the back and a ¼″ one on the left-hand side. Cut a little nick at the bottom, at right angles with the opening, and lay the right-hand side over the left in a small pleat, neatening it on the right side of the garment by two rows of backstitching, and on the wrong side by a straight hemmed tape.

Sew ¾″ wide cross-strips round the neck and armholes, and finish off with feather-stitching. Crossway strips

for facing the neck and armholes can be cut from the "left-over" at the side, which, though not "true" bias, answers quite well for the purpose.

Seam the lace to the edge of the garment, easing it enough to make it set nicely. No drawstring is required, as the petticoat fits quite plainly round the

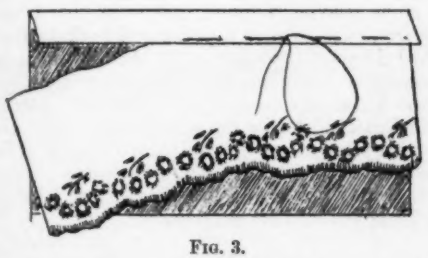


FIG. 3.

neck. If narrow embroidery be preferred instead of lace, the false hems will not be needed, as the plain part of the embroidery itself forms a false hem, as described below in No. 1.

Make two lengthwise buttonholes (both ends alike) on the right-hand side of the back, and sew buttons on the left-hand side. The frill is made of the same material, with or without embroidery or lace at the bottom. One width and a half will be sufficient for the frill, which can be made longer or shorter according to the number of tucks, the width of the hem, and the depth of the embroidery. Frills hang and wash better if cut across the material from selvedge to selvedge.

To form the Frill.—Join the two widths of material together. The model had a ¼″ hem, and two tucks the same width. The embroidery was attached to the frill by the method described in No. 1, but the other methods described are equally suitable.

Methods of attaching Embroidery, Plain or Frilled, to Raw Edges.—1. When the embroidery has a depth of plain material. This plan was adopted at the bottom of the frill in the photograph. Lay a ¼″ hem on the skirt. Before tacking it, slip under it the raw edge of the embroidery, with its wrong side facing the skirt (Fig. 3). In this case no fullness was needed. Should it be required, be sure to allow sufficient to make the frill hang nicely. The usual proportion of fullness is one and a half times the length of the space to be frilled, but the deeper the embroidery is the more fullness will

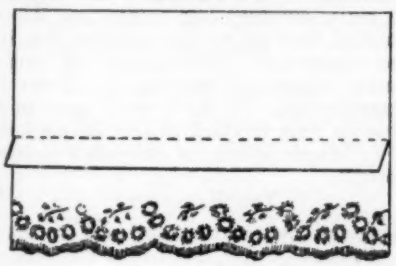


FIG. 4.

be needed. Tack the hem over the embroidery, and stitch it neatly by the sewing-machine. It will be seen that the trimming looks as if it were set under a tuck (Fig. 4). Two tucks the same width are placed above the hem. A fine machine needle and fine cotton should be selected, and the "stitch" should be a small one, or the work will be completely spoiled.

2. Lay a single fold along the raw edge of the embroidery *on the right side*, and a similar one on the wrong side of the garment to which it is to be sewn. Place the two together, face to face, like a counter-hem, and secure them by machining or feather-stitching (Fig. 5).

Frills of material can be set on by means of both the above methods, making the necessary allowance of fullness, and tacking them *very firmly* in place.

3. To attach a frill of embroidery which has a depth of plain material at the edge. Divide both the frill and the garment to which it is to be attached into halves and quarters, and mark them by a pin, or in some other way. Gather each division of the frill separately about ¼″ from the top. Place the raw edges of the skirt and frill together with their right sides inside. Allow the edge of the embroidery to extend a little *beyond* the garment. Pin the divisions of both skirt and garment together, arranging the fullness evenly and fastening the gathering-thread round a pin. Tack the two together. Either run them by hand (which was done in the photograph) or stitch them by machine. Fold the raw edge of the embroidery over, and stitch it by machine or fasten it by feather-stitching.

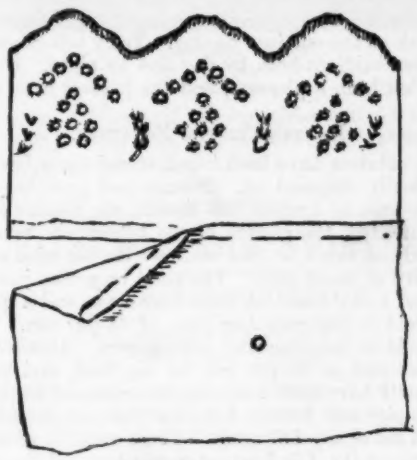


FIG. 5.

If preferred, a fold may be laid on the embroidery *before* it is gathered.

4. To affix a frill by means of a false hem. Proceed as in No. 4, but place the edges of both the frill and skirt *even* instead of allowing the one to project beyond the other. Holding the garment towards the worker, tack a ¾″ crossway strip of material at the back of the frill, and run or stitch all three together. Turn the false hem over, lay a fold, and hem it neatly on to the garment.

A WORD TO THE WISE.

The Right Hon. David Lloyd-George, in the City Temple, October 17, 1910, said:

"WE SEEM IN OUR SCHOOLS TO TRAIN PEOPLE FOR EVERYTHING BUT THE FACTS OF LIFE."

Back to the Land.

THE EXPERIENCES OF A NOVICE.

Autumn.

OCTOBER, the month of the falling leaf and of the final ingathering of the harvest, has come upon us somewhat suddenly, and has found us hardly prepared. September will be remembered for many years to come as the driest, if not the sunniest, month on record. We simply gloried in the brilliant days after such a gray summer, because it was our first experience of the country in her early autumn mood. But now we realise that the summer is ended. The colours are changing on all the landscape round; especially is this seen as one stands on the highest point of the meadow and looks towards the ever-beautiful Sussex Downs. The hedgerows, with here and there a cluster of unripened blackberries, are thinning fast, and the lanes are strewn with fallen leaves, which the wind gathers and sweeps along, filling up odd corners; and we glean them at stray moments and pitch them into the pigsty for bedding. Never have we enjoyed the harvest moon so much as the one just waning. Truly this September has been brilliant both by day and by night. Outdoor work has been a pleasure, and the hardest even a pastime.

Harvesting the Potatoes.

The potatoes have been lifted, stored for a few days, and finally disposed of. Disease had just begun its work; and, as I wrote last month, the haulms having been affected, the growth of the tubers was much restricted—so much so that we were landed with a large quantity of small ones. The total crop was just over two and a half tons. A little over a ton and a quarter were sold at the very fair price of £4 per ton. These were sold to neighbouring greengrocers. Another half-ton was sold at £2 per ton for pig food, and the remainder I have stored for my own use and for boiling up for pigs and fowls. I reckon that the disease just robbed me of my full profit. There was one gratifying thing about it: I had repeat orders from all the greengrocers who purchased them, which unfortunately I had to decline. It will be remembered that I planted between the rows of potatoes various sorts of cabbages, brussels sprouts, turnips, swedes, and beet; so that when the potatoes were gathered in the market garden still had left this further crop, which will be saleable later on.

I hired a man to dig the potatoes, and the boy and I picked them up, and with two wheelbarrows carted them from the meadow to the house and sorted them over. It took us several days, and by the time it was finished I felt quite potato sick. It was then necessary to fork the ground over, clearing it of weeds and loosening the soil round the roots of the remaining crop. This I thought I could, and must by reason of the expense, do myself. I was surprised to find it such a long job. Of course I was not able to give it my whole time; so, after sticking at it day after day, I found that in order to get it finished before the fine days were over I must get help. This is where a great difficulty arises from time to time. I find that a labouring man can do about three times as much in a day of this sort of work as I can; and I must confess that although a job like this would have been wellnigh impossible six months ago, when I was fresh from a sedentary life and weighed just a stone heavier, I found that even now I was not quite able to tackle such a prolonged back-aching task as I had imposed upon myself. And it must be remembered that the ground is rather more than half an acre, and I had my regular daily duties to attend to. Nevertheless I do feel a bit disappointed that I could not do this piece of work myself, for the cost of labour soon runs away with the whole of the profit. Perhaps, however, I may be allowed this excuse, that I have only been a *labouring man* for six months!

How I spent my Forty—— Birthday.

This is to be our last birthday. We shall henceforth cease to count the years, for do we not feel younger by many years these last few months? Six-thirty a.m. found me up and brewing a cup of tea, then out into the bracing morning air. The pigs hear my footsteps, begin to rampage, and start such an uproar that one might well surmise that the butcher's knife was not far off. However, a bucket of swill, made up of cooked vegetables and sharps, soon stopped their noise. Then the six-gallon portable copper—a recent purchase—was emptied of its contents of boiled vegetables and household scraps, and the whole mixed with meal until in a crumbly state, for the poultry. When ready this was carried round in a Sussex trug, or wooden basket, and distributed among the chickens and fowls. Fresh water is then taken to each pen, after which breakfast waits on a good appetite. After a glance at the morning paper, the copper is lit and filled with chopped vegetables, which when cooked are ready for the next day's fare. Then I went to the market garden and did a couple of hours' good work with the fork. At noon the chickens were given a midday meal, but not the grown-up fowls, and the pigs were also fed again. The afternoon was again spent in the market garden; and in the evening, after tea, all and sundry were fed again, including the bees, who are being given warm syrup at night in order to induce the queen bee to lay more eggs, and thus strengthen the colony for the winter. I may here say that the two new lots of bees, hived with so much difficulty last month, are doing fairly well, although they are weak in numbers, barely covering three frames each. Having made all snug—which means going round and fastening up all the chicken-houses against rats—the day's work came to an end. There was no time to think of the fleeting years, and no need to trouble about the oft-quoted phrase, "too old at forty."

The Haystack.

Knowing full well that at the best my hay could only be of second quality, and as the roof seemed none too thick to face our exposed position, I decided to sell my hay. I offered it to a hay merchant who was willing to purchase it, and he came with his long iron to prob its contents. I felt like having my chest sounded by a physician; for perhaps a piece pulled from the centre might be—well, even rotten. He gave me the first piece to smell—it was fusty. The next bit from another spot was a little better; but, generally speaking, it was all much alike. I had hoped for better

My First Haystack.

Far from the Motor Crowd.

things, but I cannot say I was surprised. His man came in a few days to cut it up into trusses. With his large knife he cut it into blocks of the desired size, weighed them, and tied them up into half-hundredweight trusses. It was solid enough, was of a fair colour, but, geologically speaking, there were layers of hay which many a horse would turn up his nose at. The end of the hay story is that when cut up it weighed about three and a half tons, and the most I am likely to get for it is £2 or £2, 5s. per ton. Experience has certainly been gained in this as well as in other matters, but not without cost.

Is there to be a Cow?

In view of the end of my haystack, will it not be better to keep a cow, or bring along a couple of calves, another year? Roots could be grown for her in the market garden, and the grass she could eat. I am beginning to think it would pay better in the long run. I think there must be a cow for my three acres. A portion could be fenced off to make a little hay for winter keep, and a wooden lodge erected. This lodge could be erected any time during the winter and be ready for the calves in the spring.

The Poultry Farm.

The chickens have now almost all grown up, and are a really nice-looking lot. Starting with 50 fowls, I have increased them to just 150, not counting some seventy cockerels sold to the fattener. This raises the housing question, which will now become a burning one, for my present accommodation is for about half that number. With a few exceptions I am keeping all my pullets, and so far have only sold the cockerels. These pullets now require to be treated as "grown-ups;" and although my grass-runs are large, they are best kept for eight to ten birds; so fresh houses and pens will have to be forthcoming. Here again a novice meets with a difficulty. All pullets are not worth keeping for laying purposes. An expert can with fair accuracy pick out the ne'er-do-wells at a glance. This is most important, as only likely layers pay to keep.

Fruit.

The only branch of my enterprise not yet started is the fruit-growing, and I hope next month to be able to report progress in this direction.

A TALE FOR THE STORY HOUR.

IVAN THE SIMPLETON.

A Russian Fairy Story.

BY MARIE BAYNE.

ONCE upon a time there lived in Russia three brothers. Two were married, but the third had no wife. He was a fool, or so they declared, and they called him "Ivan the Simpleton."

One day the two elder brothers went out hunting. They left Ivan at home, bidding him do as their wives commanded.

"If you are good," said they, "when we come back we shall buy you a red shirt and a pair of red boots."

They were no sooner gone that Ivan lay down on the bench by the stove and went to sleep.

When his brothers' wives saw him there, they said to him,—

"Get up, you lazy Simpleton, and fetch us some water."

Ivan rose very sulkily; he was tired of being called a fool. Yet he took the pails and set off to the lake.

When he had scooped up the water he found a pike in the second pail. The pike was an old, old fish; it had lived in the lake since no man knew when.

"Oho!" said Ivan, "here's luck for me! I will cook this pike and eat it all myself!"

But, to his surprise, the pike spoke up and answered him.

"Nay," said the pike; "don't eat me, fool. Put me back in the lake, and you shall have good fortune."

"What sort of fortune?" asked Ivan.

"Why, this sort," said the pike. "No matter what

you desire, if only you speak your order in my name, it shall be done."

"But who are you," asked Ivan, "that you have such power?"

"I am the lord of the lake," was the reply.

"It may be so," said Ivan the Simpleton; "but before I lose a good dinner I will prove your words."

So, holding the pike up in the air by its tail, he said aloud,—

"By the Pike's command and at my desire, go home, ye pails, and set yourselves in your places!"

The pails at once set off through the forest, bumping and bounding along the ground, but never spilling a drop.

"Well-a-day!" said Ivan, "this is indeed good luck! A thousand thanks, Sir Pike!" And he threw the fish back into the water.

When he got home the pails were standing against the wall. So he lay down once more on the bench by the stove and went to sleep.

Soon his sisters-in-law woke him roughly, crying,—

"Go out, you lazy fellow, and fetch us some wood."

Ivan rose, and now he was no longer sulky. He took two axes and a sledge, but he harnessed no horse to it.

"By the Pike's command and at my desire," said he, "drive into the forest, O sledge!"

Off went the horseless sledge at a terrible pace. Had Ivan been driving, he must have sat up, and, perchance, been frost-bitten. Now all he had to do was roll himself up like a dormouse and finish his nap.

They passed through a town. The horseless sledge swayed this way and that, jamming and crushing the people as it passed.

"Stop him! stop him!" cried the people.

But it was no use. The sledge was out of sight in a moment, and it did not halt till it came to a clearing in the forest.

Then Ivan the Simpleton sat up and rubbed his eyes.

"Good!" said he. "By the Pike's command and at my desire, let one of these axes fell the trees, while the other chops them into fagots!"

At once the axes leaped gaily out and began their work. Soon the sledge was filled with wood.

"Now, by the Pike's command," said Ivan, "go fetch me a cudgel!"

One of the axes went and cut him a cudgel, and the cudgel came and sat on the load of wood.

Off they went homewards. They again passed through the town, and by this time the people were waiting in a crowd to take Ivan prisoner.

They stopped the sledge and began to drag him out.

"By the Pike's command and at my request," said he, "go, cudgel, and do thy duty!"

Down jumped the cudgel, and took to thumping and bumping and knocking folks about without mercy. Soon they were strewn on the road like sheaves of corn, and the sledge went on its way.

When he got home Ivan piled the wood in the wood-shed; then he lay down on the bench by the stove and went to sleep.

Meanwhile the people of the town had sent a petition to the Czar. They told him about the horseless sledge and of all the damage it had done, and begged him to send for Ivan and punish him.

"Very well," said the Czar; "go, fetch me the Simpleton."

But at this the people shook their heads: they remembered the cudgel. At last one man proposed that the Czar should offer Ivan a bribe.

"Perhaps he will come," said he, "if we promise him a red shirt and a pair of red boots."

"Good!" said the Czar. "Go, promise him these in my name."

So the people ran to the cottage to bribe the fool.

"Go to the Czar," said they, "and he will give you a red shirt and a pair of red boots."

Ivan the Simpleton still lay on the bench by the stove. Without so much as rising, he murmured sleepily,—

"By the Pike's command and at my desire, do thou carry me, bench, to the Czar!"

The bench immediately rushed out at the door, with Ivan upon it, and soon he arrived at the palace.

The Czar was about to put Ivan to death, as the people had wished; but all at once his daughter took a great fancy to the fool. Nothing would please her but that she should marry him; and at length the Czar, in a vast rage, consented.

No sooner was the wedding over, however, than he ordered both bride and bridegroom to be placed in a tub; and this tub was sent floating away on the river Volga.

For days the fool and the Princess went sailing in the tub; but at last she grew tired, and told her husband so.

"By the Pike's command and at my desire," said he, "let us go ashore!"

They were far away from the land; but these words were no sooner spoken than the tub shot like an arrow to the shore.

Ivan and his wife stepped out upon the grass.

"But where shall we live?" asked she.

Then the fool spoke for the last time:—

"By the Pike's command and at my desire, let a marble palace be built for my dear wife and me!" And lo! there arose a most lovely palace on the banks of the Volga.

Every one wondered at its beauty. The Czar sent messengers to know who lived there; and when he learned that it was his daughter's home, he forgave the fool.

So Ivan and the Princess lived happily ever after. They ate and drank of every good thing; but there was one fish that was never seen on the Simpleton's table, and that was the lordly pike. For Ivan remembered that it was to the Pike he owed his good fortune.

A Text-book of Physics. By H. E. Hurst, M.A., B.Sc., and R. T. Lattey, M.A. (*Constable and Co., Limited, London.* 8*s.* 6*d. net.*)

This book is written, as the authors candidly tell us, primarily for the Preliminary Examination in Physics in the Oxford Natural Science School. It contains examples culled from nine different sources, from the Oxford Locals to London Intermediate Science Examination.

As a text-book on physics it calls for no particular comment. It is essentially commonplace. There are hundreds of books on the market equally good, equally well written, and, shall we also say, equally stodgy.

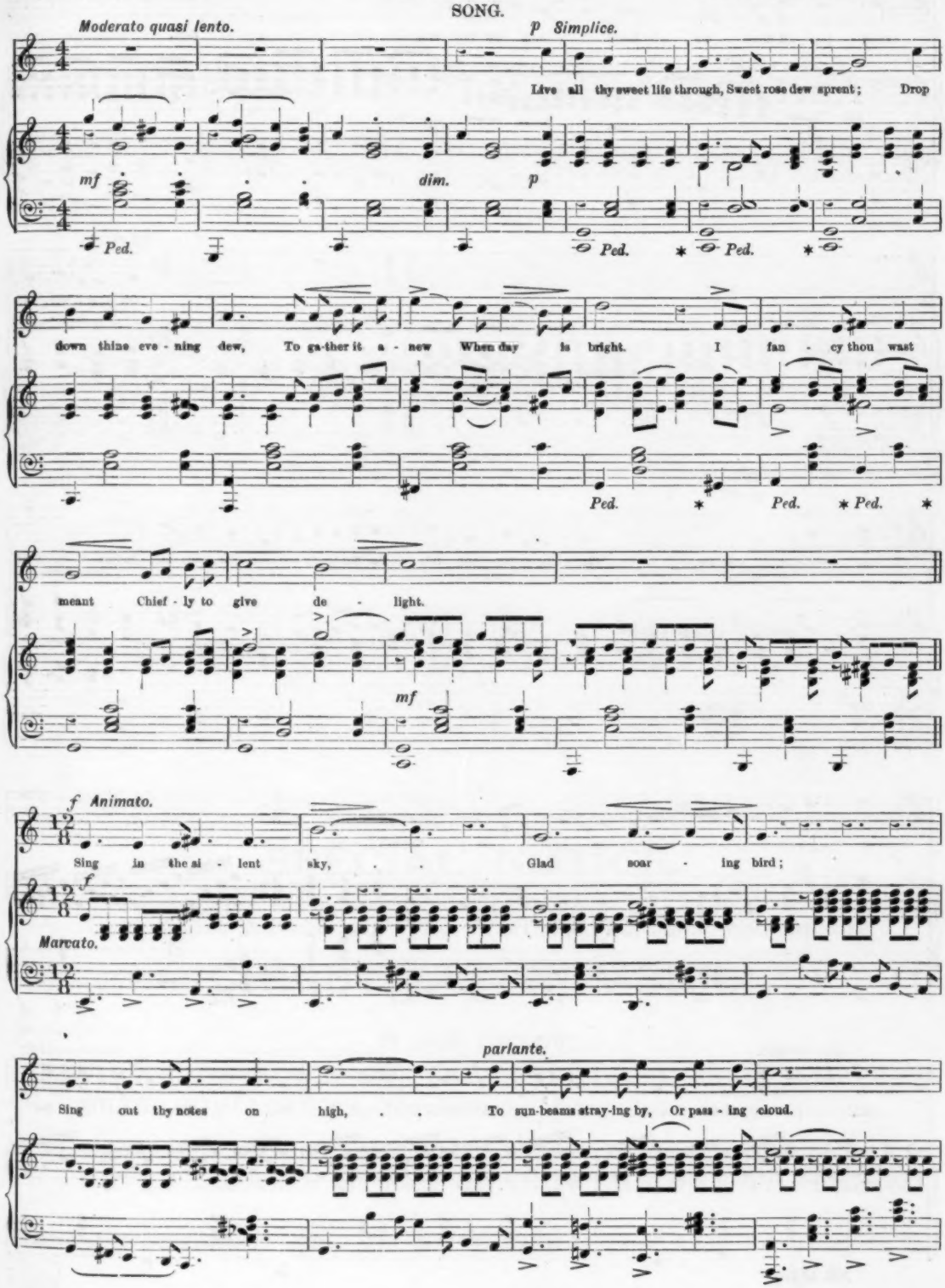
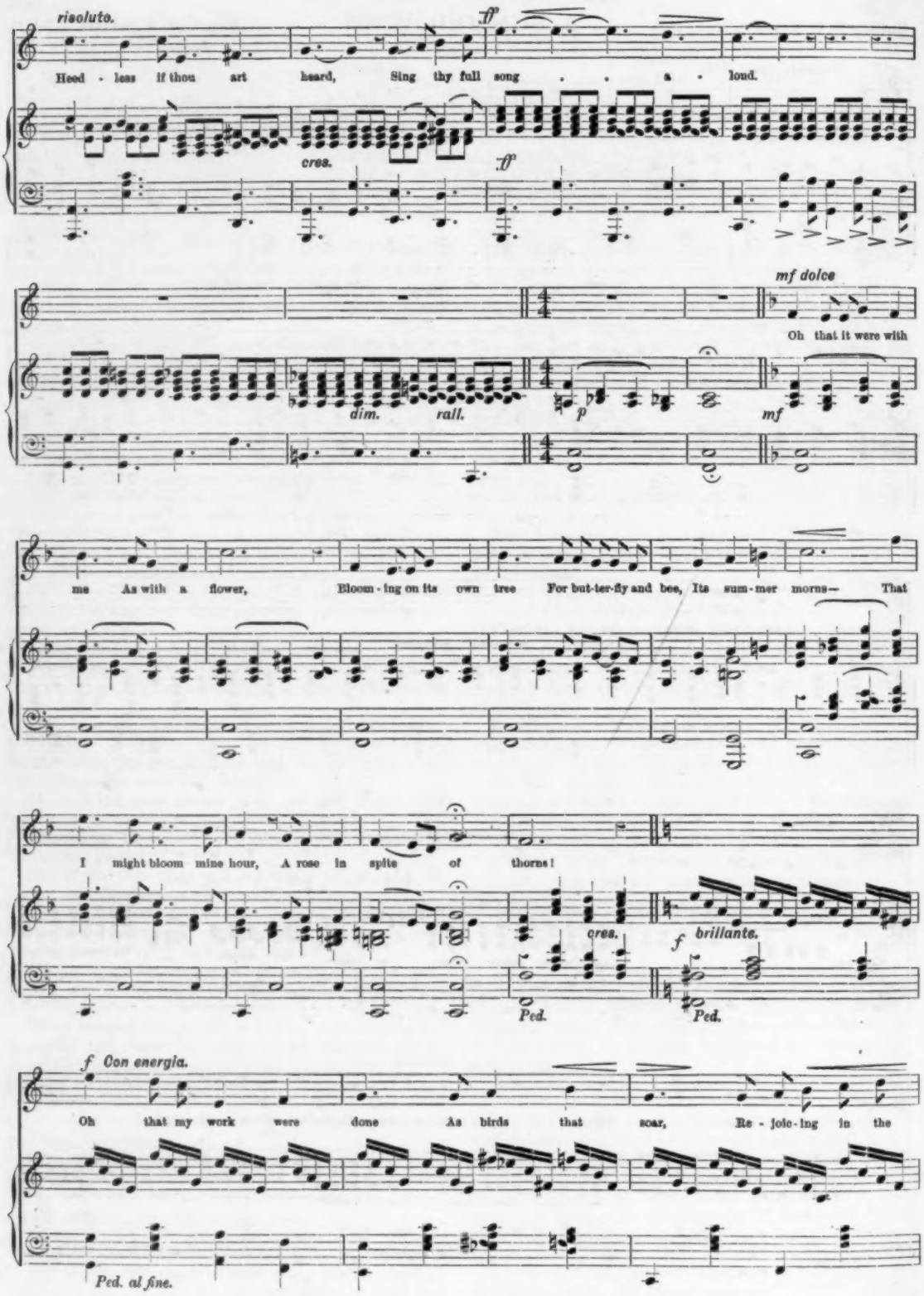
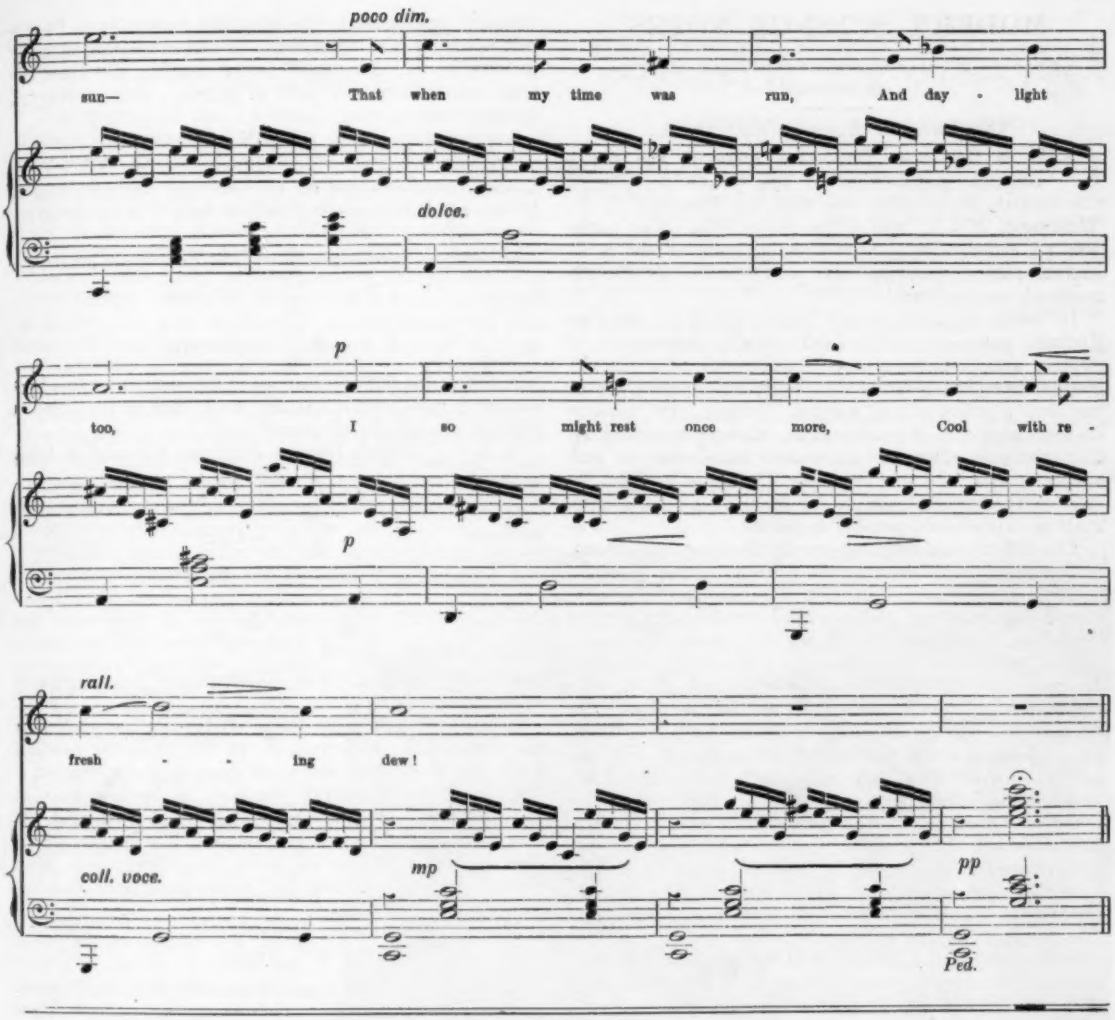
As a school text-book its price is prohibitive. In these days, when every student has the opportunity of handling apparatus, there seems little need for illustrating a book with photographs of resistance boxes, Wimshurst machines, etc. One gets enough of these in catalogues.

The book concludes with chapters on telegraphs and telephones, with the Morse alphabet complete, and a scrappy account of electric lighting circuits.

Words by C. G. ROSSETTI.

A SUMMER WISH.

SONG.

Music by F. H. SQUIRES, F.R.C.O.

Moderato quasi lento.
p Simplice.
Live all thy sweet life through, Sweet rose dew sprent; Drop
mf
dim.
p
Ped.
down thine eve - ning dew, To ga-ther it a - new When day is bright. I fan - cy thou wast
meant Chief - ly to give de - light.
mf
f Animato.
Sing in the si - lent sky, Glad soar - ing bird;
f
Marcato.
parlante.
Sing out thy notes on high, To sun-beams stray-ing by, Or pass - ing cloud.

risoluto.
ff
Head - less if thou art heard, Sing thy full song . . a . loud.
cres.
ff
mf dolce
Oh that it were with
dim.
rall.
p
mf
me As with a flower, Bloom - ing on its own tree For but-ter-fly and bee, Its sum - mer morns— That
I might bloom mine hour, A rose in spite of thorns!
cres.
f brillante.
Ped.
Ped.
f Con energia.
Oh that my work were done As birds that soar, Re - joic - ing in the
Ped. al fine.

SPECIAL NOTICE.

Next Month's Issue of "The Practical Teacher" will be the

CHRISTMAS NUMBER.

It will contain

1. REVIEWS OF SOME OF THE BEST GIFT BOOKS OF THE BEST PUBLISHERS, conveniently arranged for ready selection.
2. THE USUAL USEFUL ARTICLES FOR WHICH THE JOURNAL IS NOTED, and which will NOT BE CROWDED OUT BY REVIEWS.

Ready November 25. Of all Booksellers and Newsagents.

MODERN SCIENCE NOTES.

BY J. G. M'INTOSH, B.SC., SECONDARY SCHOOL, GATESHEAD.

The Laws of Electro-Mechanics.

ONE of the most important amongst the many scientific papers read at this year's meeting of the British Association was that by Professor S. P. Thompson, F.R.S., under the above title. The paper was an attempt to put into shape some of the well-known rules regulating the performance of electro-magnetic mechanisms.

In every electro-magnetic apparatus there are two distinct parts—a well-defined circuit, commonly of copper, and a more or less definite magnetic circuit. For example, in one of the most early and simplest forms we have a solenoid and an iron plunger. On turning on the current in the solenoid the plunger is sucked up into the coil. Here we have interlinked electric and magnetic flux. It was Professor Thompson's object to express this interlinkage in the form of simple mathematical expressions, parallel in nature.

The difficulty of defining exactly the magnetic circuit is illustrated in the case of the solenoid in the presence of several masses of iron. In this case the magnetic lines form inside the coil as closed circuits surrounding the wires, which spread out as the current increases. At the ends of the coil these lines curve through the air, those which meet the masses of iron taking the easier path through them. Hence in this case the magnetic circuit is indefinable. In any case, however, no mechanical action is obtained unless the two circuits are interlinked with each other. In the case of an anchor ring wound with one turn of copper wire the magnetic circuit is well defined. Each circuit is then linked once with the other. As the turns increase the interlinkage is increased in proportion. This interlinked system presents an initial configuration, which alters as a whole whenever mechanical action is produced. If C be the current in absolute units, N the amount of magnetic flux, and S the number of times the electric circuit is interlinked with the magnetic, the potential of the system is proportional to each separately, and therefore proportional to the product CSN.

The law of action is generally stated as follows: "Every electro-magnetic system tends so to change its configuration that the product CSN is a maximum"—that is, in such a way as to bring about the greatest possible amount of interlinkage.

An electro-magnet attracts its keeper because, when the latter moves up, the interlinkage of the system is increased.

Professor Thompson then proceeded to connect the three quantities C, S, N by the following physical relations:—

1. *Law of the Magnetic Circuit.*

$$N = \frac{4\pi CS}{Z},$$

where Z denotes the reluctance of the circuit, and is dependent on the configuration and material of which it is composed. When no leakage takes place, as in the case of the magnetisation of an anchor ring, S is the same thing as the number of turns of the current-carrying conductor. In more complicated cases, S may be looked upon as the equivalent turns, or the coefficient of interlinkage. The difficulty of ascertaining the numeric representing this quantity is overcome by experiments of the coefficient of self-induction, usually denoted by L. This coefficient is nothing else than the total interlinkage per unit of current, and is denoted by the relation

$$L = \frac{SN}{C}.$$

L may be determined by the ordinary methods and N by means of an exploring coil, whence C is immediately deducible.

2. *Law of Induction.*—Given the Faraday's form, this is

$$E = -\frac{dN}{dt} \text{ in one turn,}$$

or,

$$E = -S\frac{dn}{dt} \text{ for S turns,}$$

where E is the E.M.F. induced in the electric circuit by a change in the interlinked flux such that in the time at the flux changes by the amount dN.

3. *Law of Electric Power.*—Denoting the rate of doing work by $\frac{dW}{dt}$

we have

$$\frac{dW}{dt} = -CE.$$

4. Combining 2 and 3 we obtain—

$$\frac{dW}{dt} = -CS.\frac{dN}{dt};$$

whence $dW = -CS.dN$,

and $\therefore W = CSN$ if CS be constant and N independent of C.

In the case where a change of flux occurs, such that the initial flux alters from N_1 to N_2, while the product CS is constant, then the work done in the operation is $CS(N_1 - N_2)$. With CS constant, as in the case of the motor, the law may be stated in the form that the flux tends to become a maximum. The keeper of an electro-magnet moves so as to magnetise itself more strongly, thus bettering the magnetic circuit and increasing the interlinkage.

The law of work may be written:—

$$W = \int CS dN.$$

If CS is constant and N an independent flux, the integral is $W = CSN$, as before. If N is due solely to C, then the integral has the value—

$$W = \tfrac{1}{2}CSN.$$

5. *Law of Change of Flux.*—Any change in the configuration of the magnetic circuit produces in turn a change of reluctance, which again produces a change of flux.

Differentiating (1) we have—

$$dN = -\frac{4\pi CS}{Z^2}.dz.$$

Combining with (4)—

$$dW = -\frac{4\pi C^2S^2}{Z^2}.dZ = -\frac{N^2}{4\pi}.dz.$$

Thus the change in the work done by the operation of the mechanism is equal to the change in magnetic reluctance and to the square of the original flux.

6. *Law of Force.*

$$F = \frac{dW}{dx}.$$

where F is the force and dx the element of displacement.

$$\therefore f = -\frac{4\pi C^2S^2}{Z^2}.\frac{dz}{dx}; \text{ also from (4)} = -CS.\frac{dN}{dx}.$$

—that is, assuming CS constant, the force is propor-

tional to the rate of decrease of flux per unit length of displacement.

The Teaching of Mathematics.

The apostles of the "reform" movement in mathematical teaching are beginning to reap the reward of their work. In the address to the Mathematical Section at the British Association meeting Professor Hobson had some laudatory remarks to make on the movement, while at the same time he pointed out some of the real dangers of excessive zeal. In the earliest teaching he advocated the study of mathematics chiefly from the observational side, to be followed by a mixed treatment of observation and deduction. Referring to the tendency of examiners to insist upon a regular order in the sequence of propositions, Professor Hobson very pertinently pointed out that such an order would be doubtless a great gain from the point of view of easy examination of work done. It would doubtless be very easy work if a uniform text-book were adopted; but Professor Hobson urged that even the convenience of the examiner must be sacrificed in the more important interests of education.

"Of the many evils which our examination system has inflicted upon us, the central one has consisted in forcing our school and university teaching into moulds determined not by the true interests of education, but by the mechanical exigencies of the examination syllabus."

Could any words be more applicable than at the present time, when in most secondary schools the omega of the course is the pernicious Oxford Local or its twin brother of London. We venture to suggest that these words should be hung over the portals of every secondary school in the kingdom and daily digested.

Professor Hobson, himself a distinguished pure mathematician, made a remarkable admission in his advocacy for freedom of teaching. Addressing himself to the question of the logical treatment of propositions, he acknowledged that, whilst it was of the highest importance to the pure mathematician, it was wholly unsuitable to the majority of students.

"I draw, then, the conclusion that a mixed treatment of geometry, as of mechanics, must prevail in the future, as it has done in the past, but that the proposition of the observational or intuitional factor to the logical must vary in accordance with the needs and intellectual attainments of the students, and that a large measure of freedom of judgment must be left to the teacher."

Second Stage Hygiene. **By *A. E. Ikin, B.Sc., and R. A. Lyster, M.D.* (*W. B. Clive.*)**

This is the third edition of a book designed to meet the requirements of the Board of Education Syllabus in the above subject. It partakes of the up-to-date and practical character of all the publications of this well-known firm. The concluding chapter contains useful Notes on the experiments suggested by the Board of Education.

PRACTICAL NOTES ON SCHOOL GARDENING FOR NOVEMBER.

BY BRUCE COOK, F.R.H.S., CHINGFORD.

Flower Culture.

DURING suitable weather hyacinths and tulips may still be planted out in beds. Likewise snowdrops and crocuses. They should, however, be planted in position as early in the month as possible. All bulbs to be planted in beds and grown outside should be covered with at least four inches of soil. Refer to notes on bulb-growing in last month's issue.

Wallflowers and *primroses* may be planted in fine open weather. Never dig the ground or plant during hard frost.

Hardy perennials may, in districts where the soil is light, be divided and replanted in well-dug and well-manured soil. On heavy clay soils it is better to defer planting until next February or March, but, during suitable weather in November and December, dig and manure the ground thoroughly and leave its surface as rough and lumpy as possible, in order that the frost, rain, etc., may thoroughly break the heavy soil up into a fine tilth and kill pests contained therein.

Flower borders should be looked over, and any suggested alterations in shape and planting discussed and planned out on paper.

A Practical Lesson on Planting Bulbs in Pots.

Even in the best of gardens labels get lost. Rewrite any that may require it.

Paths can also receive attention. Briefly, to form a rough path, you should dig out the soil to, say, six or seven inches, and put in four or five inches of brickbats, large stones, broken slates, etc. Cover this with, say, another inch of gravel, cinders, or clinker. Give the whole a good covering of sifted ashes or fine gravel. Cement and other paths will possibly be touched on later. On no account do we suggest having grass paths in school gardens. We only knew of one, and after the first year the teacher had the grass dug up and paths made similar to the one just described.

Bulbs, especially hyacinths, can be still potted up for early flowering. The following is a "practical lesson": First have the pots well washed and scrubbed outside and inside. Have some old cracked flower-pots broken up for use for drainage. Obtain a good supply of fine rich soil, containing a proportion of leaf-mould and sand. Having purchased your bulbs, let the boys examine them carefully. You might with advantage cut one through the centre, showing the formation to the class. One point to be kept in mind when buying the bulbs is that you obtain them from a reliable firm. Poor bulbs are never satisfactory. We obtained ours from Gamage of Holborn, and they were all a good sample of what bulbs should be. As to size of pots, we

have found from experience that 48's—that is, pots that are about 5 inches across the top and the same in depth—are the most suitable size. Having well mixed the soil, place a few pieces of broken flower-pot (or cinders) at the bottom of the pot for drainage. The boys should be standing round, so that they can watch the teacher as he proceeds. Then place about two inches

Boys Planting Bulbs.

of soil in the pot over the drainage. Select three bulbs, which is the number that can be well grown in a 48 pot. Then lightly press the flat end of the bulb into the soil in the pot. Cover the bulb with the prepared soil to within half an inch of the top of the pot, so that the crown or growing-point of the bulb just peeps through the surface of the soil. Then select one of your most promising pupils, and let him (or her) try to carry out the work. See that the bulbs are planted equidistant in the pot. Having potted all the bulbs, take some pieces of slate, and stand the pots on the same in some odd corner of the garden. If you do not possess any slate, cover a piece of ground with about three inches of sharp cinders. By standing the bottom of the pots on the slate or cinders you prevent worms and slugs from entering the pots.

Give the bulbs a good watering with a watering-can with a fine rose. Then cover the whole of the pots and bulbs with five or six inches of fine sifted ashes. Cocoanut fibre will do. This covering material should be worked in between the pots. The covering protects the bulbs in the pots from any frost. Leave them in the bed, say, for eleven or twelve weeks, exposed to the rain, which as it falls keeps the whole damp. At the end of this time carefully remove some of the ashes and take out one pot, and see if there is any sign of the bulbs growing. You will generally find a yellowish growth at the growing-point of each bulb, and the pots will be found to be full of roots. If upon examination you find that growth has not begun, return the pot and cover again with ashes for another week or so.

When growth is satisfactory, remove the pots from the heap and wash the outsides of the pots clean. Keep the pots with the bulbs in a somewhat dark corner of the school, standing them in saucers for, say, a fortnight, during which time they should be watered regularly. By this time the yellow, sickly-looking growths will have changed to a healthy green colour. Then arrange the pots in the window-sills on the sunny side of the schoolroom. They will only require watering and turning round occasionally, and perhaps staking.

The photographs illustrating "Growing Bulbs in Pots" explain the operations.

Pots and Bulbs ready for being covered with Five Inches of Ashes.

Fruit Culture.

Raspberry beds may be made. If the plants are to be grown in the general plot, they should be set out in rows four or five feet asunder. Plant three rooted canes in groups four feet apart in the rows.

The ground should be well dug and thoroughly and richly manured. It is scarcely possible for the ground to be too rich for raspberries. If the ground is a heavy clay and requires autumn digging, it would be better to defer planting out the canes until early next spring.

Whether planted in the autumn or spring, the canes should be cut back to within five or six eyes or buds from the ground-line at the time of planting.

See that the roots are not cramped for room when planting, and work some fine soil in among the roots, and tread firmly. Then spread a two-inch covering of short manure over the surface of the soil, covering the roots. Never use manure fresh from the stable for mulching or digging into the soil, except on clayey soils in autumn cultivation. When necessary the plants should be staked. A good strong stake about two inches square should be driven into the ground at each end of the row for, say, eighteen inches, after the end has been tarred to prevent rotting. If the row is a long one, you might with advantage put in another stake in the middle of the row. Let the stake be about 6 feet out of the soil. Put a strand of wire along the three stakes 18 inches from the soil, then another strand 2 feet higher up, and a final strand another 2 feet higher. Good posts and wire will last for years. Another plan for staking, but hardly so satisfactory, is to drive in stakes of wood similar to those mentioned, except that they need not be larger than one inch square. Put one stake to each clump of three plants. They should be trained to the wire or stakes as they grow. Personally I prefer the former method of training on wire.

EXAMINING THE ROOTS OF APPLE TREE BEFORE PLANTING.

PLANTING THE APPLE TREE IN THE PREPARED HOLE.

Root-pruning of fruit trees.—This operation is best done early in November, during open, dry weather. Measure about three or four feet from the main stem or trunk of the tree, and describe a rough circle. Outside this circle make a trench, say, two feet deep and the same distance in width. Should any thick roots be met with in this trench, carefully cut them through. Work under the tree, severing and removing any large root-stems that do not seem to possess many fibrous roots. Some only operate on one-half of the tree one year, and treat the other half after the lapse of two years. This may be recommended in some instances. Any roots that may have been badly bruised and broken should be trimmed with a sharp knife, as a bruised root heals slowly and seldom forms fibrous roots, whereas a nice, clean cut quickly heals, and in many cases produces an abundance of fibrous roots. When you have finished trimming the roots, replace the soil, working it right under the tree. Level the ground and mulch. It is an excellent plan to sprinkle a little "naptho nicotyl" over the soil as you put it back in its place, as this kills any pests that may be in the soil.

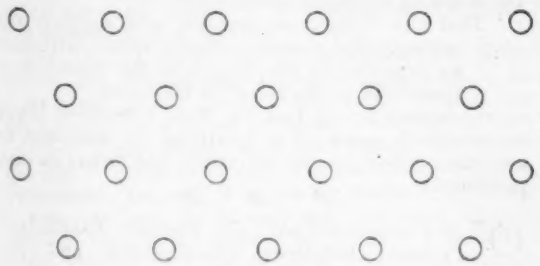


FIG. 1.

Planting of fruit trees.—Personally, we do not recommend the planting of standard trees in school gardens, as they are a much longer time coming into bearing. They take up too much room, and cannot be pruned later on without a ladder or long pruner.

For school and small gardens generally we suggest the planting of apples on the dwarf or paradise stock. Of course we are not dealing with the planting of permanent orchards.

Having decided on the site in which you are going to plant the trees, have the ground well dug, if possible to the depth of two feet at least. The subsoil may be broken up, but do not bring it to the top. Say you are going to plant trees on the paradise stock, they should be planted eight feet apart in the rows, and the rows should be about that distance apart. Plan out the ground as in Fig. 1, and put in a peg where each tree is to be planted. Dig out a hole for each tree, say, three feet across and from one to two feet in depth. Should the trees arrive with the roots in a very dry state, stand each tree in water for a short time. (Of course, do not expose the roots to the frost on any account.) Then examine the roots; and if any are broken, trim the broken ends with a sharp knife (see picture). Remove the tree to the hole prepared for it, and spread out the fibrous roots evenly. Let one of the lads hold the tree in an upright position (see picture). Then note where the mark on the stem is, showing how deep it was in the soil before the tree was dug up. This is most important, as you should plant the tree about the same depth as it was in the ground before its removal. Shovel the soil in slowly and carefully, working the fine soil in among the roots with the hands as planting goes on. Tread the soil firmly as you proceed. Level the ground, and mulch with, say, an inch of short manure. Stake if necessary. Bear in mind, especially on cold clay soils, never to plant in wet weather.

VEGETABLE CULTURE.

Parsnips may be dug as required.

Winter greens of all kinds should be examined occasionally and the dead leaves removed.

Celery should have had the final earthing up. On the approach of very frosty weather the rows may be protected by old sacks, mats, etc.

Manure and dig over any vacant land. Notes on ridging, double-digging, trenching will be given next month.

Rhubarb should be covered with strawy manure, old boxes, etc., for protection against frost and to produce early crops in the next spring.

ANSWERS TO CORRESPONDENTS.

BURTON.—As yours is a light soil, apply a good dressing of soot late in November, and dig in at once. Or better still, apply

"naptho nicotyl," which can be obtained from Voss & Co., Millwall, E. Grow beans, peas, or potatoes on the soil, but do not plant any cabbages for at least two years.

LAYCOCK.—(1.) Alter the lesson and log it. Questions 2, 3, 4: I would suggest that you write your H.M. Inspector and ask his advice. (5.) Ask your caretaker to give an eye during the holidays, or arrange for some of the lads to take charge in turn. (6.) I should say that you can, if you like, give instruction in gardening to the lads during the evening, but you could not register the same. (7.) The county authorities will in some instances pay for cutting down trees, etc.—in fact, preparing the ground generally.

BEGINNER.—Refer to the May issue of the *Practical Teacher* and see answer to "Rural."

ARTHUR K.—You say that you never heard of "grease-banding." It certainly has been in force among large fruit-growers for several years. I have tried it for the last eleven years with grand results. As to expense, a half-crown tin goes a long way; and if you securely fix the lid of the tin, the grease will keep from year to year.

MISS L.—I have never tried the firm you mention, but no doubt their bulbs would turn out satisfactorily. We have had some bulbs from Gamage's, Holborn, this year, and they are

THE APPLE TREE PLANTED AND THE GROUND MULCHED.

certainly fine ones. Approach your local managers, and get them to obtain permission from your county committee to incur the expense. As to thoroughly digging the ground, I would not suggest that you attempt it yourself. If, as you say in your long letter, you want to do it yourself, do a little at a time.

HANDY MAN.—Certainly not. A few rules for "school gardening" appeared in the April number of the *Practical Teacher*. Kindly refer to these.

WILLING.—You must not expect too much from the lads at the commencement, and do not be discouraged if one or two crops are an utter failure. I should say your land is infested with wire-worm. Have it dug up roughly this month, or even ridge the ground, and leave the soil exposed to the action of the frost and air during the winter months. Apply some "naptho nicotyl." You can obtain it from Voss and Co., Millwall, E.

BEGINNER (Cumberland).—Write again next January or February.

GUNTON.—I cannot undertake to name fruits. The apple you sent, however, was a poor specimen of "Bramley's Seedling," which, as a matter of fact, does fairly well here on a clay soil.

G. H.—Apply to Mr. C. Wakely, County Offices, Chelmsford.

M. K., LESTER, and CLEVELAND.—Take in some gardening paper. There are several. Try *Amateur Gardening*, published weekly at one penny. It is one of the best, if not the best.

NOVICE.—Personally, I should not include it in the scheme. A manager who is a keen gardener might, if he thinks fit, pay for the expense of the class. In fact, we know one who does. But I know your county authorities are "gone" on school gardening, so you will have no difficulty.

MISS G., LANCS.—A scheme of work will appear in the January issue.

WILLIAM R.—Good fruiting trees can be obtained from Bunyards, fruit growers, Maidstone. It is better to pay a little extra for three or four old fruiting trees.

Those correspondents who have not been attended to this month will find their queries answered in the "Monthly Notes" later on.

SPECIAL NOTICE.—All letters containing any doubts or difficulties must reach me not later than the fourth of the month, in order that answers can appear in the following month's issue of the *Practical Teacher*.

N.U.T. NOTES.

BY ALLEN CROFT.

DURING recent years the work of the N.U.T. has expanded in all directions, and from time to time I have been privileged to refer in these "Notes" to the activity of its Secondary Schools Committee, which is now a recognised portion of the organisation at Russell Square. Equally important in their way are the periodical conferences between the Executive and the principals of training colleges.

Admission to Training Colleges—

Amongst various urgent questions discussed between the principals and the Executive during the current year has been that of the examinations qualifying for admission to a training college, of which there is almost a bewildering number and variety. Cases had been reported to our own Education Committee in which the Board of Education had definitely approved a particular final examination as part of the scheme for the training of bursars, and yet certain colleges had refused admission to these students on the ground that they had not passed another qualifying examination which was regarded as more suitable. The undoubted hardship to these particular students is obvious, though it is universally admitted that the qualifying examinations vary considerably in difficulty and standard. A joint-committee of principals and Executive members having considered the question very thoroughly, adopted the following resolution unanimously:—

> "That this Committee approves and supports the principle of a general system of school certificates as suggested in the Report of the Consultative Committee of the Board of Education,"

on the understanding that the Final Certificate might be universally accepted as qualifying for admission to a training college, to any university, and to any learned profession.

* * *

—And Other Matters.

ON this committee were Dr. Fletcher (Cambridge), Professor Henderson (Nottingham), and Mr. Roscoe (Birmingham), representing university colleges; Miss Jenkins (Edge Hill), the Rev. H. A. Bren (Cheltenham), the Rev. H. Wesley Dennis (Battersea), the Rev. Preb. Hobson (Tottenham), and the Rev. Dr. H. B. Workman (Westminster), representing colleges taking

degree course students; the Rev. J. D. Best (Chester), the Rev. A. W. Parry (Carmarthen), and the Rev. V. W. Pearson (Sheffield), representing other colleges; whilst the Union representatives were Messrs. C. W. Hole, W. B. Steer, T. H. J. Underdown, Ernest Gray, Sir James Yoxall, and myself. The full Conference, after a series of admirable speeches from Mr. Ernest Gray, Mr. Sharples, and others, unanimously agreed that inquiries should be made from representative secondary schools, directors of education, employers of labour, training college principals, and others interested, in order to ascertain their views respecting a scheme for the establishment of secondary school efficiency certificates of a generally recognisable character. A report on the subject will be submitted to a further conference in the late autumn, probably on November 26.

At the same meeting will be further considered the position with regard to the supply of teachers, and the desirability and possibility of releasing students from certain colleges in July and from others in December. Readers of the *Practical Teacher* are already familiar with the difficulty in which some five thousand young men and women, who all complete their college training at the same moment, inevitably find themselves in their quest for employment, and anything which could obviate this would doubtless be gladly welcomed. But I do not shut my eyes to the inherent intricacies of the position, and to the many changes that would be necessary in the organisation of our secondary schools system as a result of the adoption of the principle of the half-yearly discharge of training college students. It might even lead to the still further extension of that professional and educational abomination, the purely *local* training college—from which may we be delivered!

Juvenile Street Traders.

CLOSE on the heels of the Reports on Half-time and Compulsory Continuation Schools comes the Home Office Report on Street Trading. It is gratifying to all those who are interested in the welfare of our young people to find so much attention being given officially to the adolescent problem.

Mr. Cyril Jackson's Boy Labour Report let considerable light into the evils of the gamin of the gutter, and now, in the findings of Mr. Gladstone's Committee appointed to inquire into the working of the Employment of Children Act, we are brought to the threshold of legislation. The Committee, for sufficient reasons, narrowed the range of consideration to street trading by children. As a result of evidence received, the distinction between the boy delivering newspapers for a newsagent, who employs him under definite terms, and the newsboy of the streets, who is his own master, was emphasised. "A superintendent of police, who spoke with special experience of the poorer quarters of London, drew a sharp distinction between the respectability of these two classes."

It appears that, briefly stated, the law stands thus: "In the daytime, between 6 a.m. and 9 p.m., a child who has reached the age of eleven is restrained from street trading only so far as bye-laws for this purpose have been made and enforced."

The Committee ascertained that bye-laws are in force in all the large centres of population except Leeds, Nottingham, Salford, and a few others.

Out of the 74 county boroughs in England and Wales no less than 50 have made street-trading bye-laws. As regards the smaller boroughs and urban districts, on the contrary, only 41 out of 191 have adopted the Act. Of the 62 administrative counties of England and Wales the Act is enforced in only London, Middlesex, and Gloucester. The evil, it is thereby deduced, is chiefly a town problem. It is regrettable to learn that in Scotland the Act is almost a dead letter. "In Edinburgh, children as young as seven were found trading in the streets." "In Waterford, newspapers are sold by children of nine years old up to 11 p.m." In Manchester alone, it appears, has the regulation of street trading been really successfully tackled. It has been difficult to obtain accurate statistics, but the Committee find that more than 37,000 children are officially recorded as street traders in London and those towns with a licensing system. A very large addition to this total is necessary in estimating the total number of street traders in England and Wales, because of the areas where no licenses are issued. It is certain that over 25,000 scholars attending day schools are street traders. Newspaper-selling is found to be the commonest form. In England and Wales over 16,000 persons under sixteen are licensed to sell papers. The boys trade on their own account. "A quire of 26 halfpenny papers is bought for 8½d. and sold for 1s. 1d., with possibility of 1d. or 2d. extra received from purchasers not demanding their change." "Shoe-blacking is a declining industry." The information respecting the ages is interesting. In England and Wales there are 15,321 licenses for those who are below fourteen, and only 6,704 for those above fourteen years of age.

The most serious portion of the Report is that dealing with the effects of street trading on the morals and physique of the children.

"The effect of street trading upon the character is only too frequently disastrous: the youthful street trader associates with and acquires the habits of the frequenters of the kerbstone and the gutter. The evidence before us was extraordinarily strong as to the extent to which betting prevails among the boy vendors of the evening paper." "Street trading tends to produce a restless disposition and a dislike of restraint, which makes children unwilling to settle down to any regular employment."

As regards girls, the Committee find unanimously and unhesitatingly that street trading tends towards immorality. "An occupation entailing such perils is indisputably unfit for girls."

It is surprising to read that really large sums are earned by the newsboys in some towns. "In Liverpool 3s. 6d. nightly can be earned, and in Edinburgh the figure given was 8s. to 10s. a week."

And now for the remedies recommended. The majority go for "the complete statutory prohibition" of street trading either by boys or by girls up to a specific age. In the case of boys, seventeen years is named; for girls the age should never be less than eighteen years, and twenty-one would be better. The Committee found, after inquiry, that except in few towns it would not be difficult for those prohibited from street trading to find other and more suitable employment.

Experiments in Dramatic History.

BY FRED. E. MELTON, SHENLEY, BUCKS.

(*Continued from page 269.*)

THE INTRODUCTION OF CHRISTIANITY.

SUMMARY.

DURING the many years in which the Britons offered resistance to the strength of the Angles and Saxons, the faint hold which Christianity had upon the British was lost, or, if not lost, driven away with them into the mountain fastnesses of Wales. The Saxons were worshippers of many gods, whose names are still preserved in some of the days of the week. Thus Tew, the god of night, is found in our word Tuesday; Woden in Wednesday; Thor, the god of thunder, in Thursday; Frea, the goddess of all goodness, in Friday. Similarly the worship of the sun and moon gives to us Sunday and Monday. The Saxons believed in a future existence in a heaven, or Valhalla, when they would feast and fight through eternity. Thus, as they lived by war, their gods were warriors and all their ideals warlike in character. Strength and manly beauty were the qualities most adored among them, and to be weak was to be held in contempt.

Upon such a foundation the ideals of Christianity could scarcely expect to build; but Augustine, a monk of Rome, was sent by Pope Gregory as a missionary to Angleland. Here Ethelbert, the King of Kent and overlord of the land as far north as the Humber, had married Bertha, the daughter of Charibert, King of the Franks. She was a Christian princess; and although she was allowed to exercise her religious beliefs, yet Ethelbert still continued to worship those gods whom his forefathers had venerated. When Augustine came in 597 A.D., he was welcomed by Ethelbert for his wife's sake, and very soon he converted the king to Christianity. With the conversion of the king came the conversion of the people; and in but a short time Woden and Thor, Frea and Baldur, the worship of sun and moon, were things of the past. So the tenets of Christ gained headway among the people of Angleland—or England, as Britain was now called.

Play IV.

CHARACTERS.

GREGORY, afterwards Pope of Rome; TWO MONKS; A SLAVE-DEALER; TWO ENGLISH SLAVES; ETHELBERT, King of Kent; BERTHA, his wife—a Christian; ST. AUGUSTINE, a monk sent by Pope Gregory; Monks, Courtiers, Ladies, Slaves, Slave-dealers, etc.

SCENE I.—THE SLAVE MARKET IN ROME.

[*Slaves, chained together, scattered about in groups on raised platforms, some standing, others seated dejectedly; slave-drivers continually coming and going with fresh gangs of slaves; buyers passing to and fro, questioning the drivers and inspecting the slaves. As slaves are bought and sold, so they are led away by their owners. (This action should be continuous throughout the scene.) In the middle stand two white slaves, with heads hanging and a look of utter misery. Close by stands a slave-dealer. Enter Gregory, followed by two monks, each person carrying a long staff and talking quietly together.*

1*st Monk* [*Turning to Gregory*] Father, I would that our steps had led us to some other part of the city.

Gregory. [*Stopping, and turning to the monk*] Why, my son?

1*st Monk.* [*Pointing to the market*] The sight of these poor slaves makes me unhappy, powerless as I am to help them.

Gregory. Patience, my son, have patience; for great changes work slowly, and slavery has held its place in this city for many centuries.

2*nd Monk.* [*Stepping forward*] But is it right, my father, that men should hold and bind one another in this way?

Gregory. Nay, it is far from right; but the people are still ignorant of the blessings of Christianity, and they hold fast by their old ideas. The day will surely come when all wrongs will be righted, but the time is not yet.

1*st Monk.* [*Turning away*] Let us turn back, father, for the sight is grievous.

Gregory. [*Looking towards the slaves*] Nay, rather let us go on, and remember in the sorrows of others to be humble and grateful in our own present happiness. Come, my children, let us go forward.

[*They move on, Gregory leading them. Suddenly he stops before the two child slaves, and calls the attention of the monks to them.*

What pretty faces! Poor little children, that they should so suffer slavery at such a tender age!

1*st Monk.* O father! the pity of it! And we so helpless to aid them!

Gregory. Say not so, for I can set them free with such money as I have.

2*nd Monk.* Let us go quickly, then, and ask their value from yonder dealer.

[*All hurry forward to dealer, who comes to meet them, whip in hand. The children look up to see who is coming, and then once again drop their heads sorrowfully.*

Gregory. [*To dealer, who listens respectfully*] Yonder little boys interest me. May I speak with them?

Dealer. [*Turning and looking towards the lads*] Willingly, lord; but I am afraid they will not understand your speech.

Gregory. No matter; but I would hear them speak. Such lovely children should have sweet voices. [*Turning to the children and laying his hands upon their heads.*] Whence come you, little ones? [*The children look up, and then shake their heads.*

Dealer. [*Raising his whip and moving towards the children*] I will make them speak for you quickly enough.

Gregory. [*Raising his hand, and stepping between the dealer and the boys*] Nay, friend, do not beat them. Ask them whence they come.

Dealer. [*Turning sulkily*] They are Angles.

Gregory. [*To the monks*] Angles? Nay, angels rather, such sweet looks have they. [*Turning again to the dealer*] Can you tell me to what tribe they belong?

Dealer. They come from Deira.

Gregory. Why, the very name means "anger," and such as they should know of naught but kindness and love.

1st Monk. [*Turning to the other*] Would that we could free this people, who have the name of anger, from the wrath of God!

2nd Monk. 'Tis well said, my brother, for 'tis pitiful that such children should be ignorant of the love that awaits them in the Christian faith.

Gregory. [*Thoughtfully*] These children shall not long be ignorant, and with God's help their Saxon brethren across the seas shall soon hear of our faith. [*Again turning to the dealer*] What is the name of their king?

Dealer. I know not, but I will ask them. [*Turning fiercely on the children, and speaking roughly to them in their own tongue*] Who is your king?

Slaves. [*Speaking together*] Our king is Ella.

Dealer. [*Turning to Gregory and the monks*] They say that the name of their king is Ella.

Gregory. [*To the monks*] Ella! Soon they shall sing Alleluia. [*Turning brusquely to the dealer*] Are these children for sale?

Dealer. Yes, lord; they are my property, and I am willing to sell them at a fair price.

Gregory. [*Aside*] I do not believe in buying and selling slaves as so many cattle, but I must do it now for the sake of the little ones. [*Turning to the dealer*] What is your price?

Dealer. [*Cunningly*] Give me but fifty golden staters and the boys are yours.

Gregory. [*To the monks*] We will not bargain with this man. [*Turning to the dealer, and counting the money into his hand*] Set them free. [*The slave-dealer knocks off the boys' chains.*] Come, my little ones, and I will be a father to you. Look up, for your sorrows are at an end.

[*Gregory holds out his hands to the children, who, although they cannot understand his speech, smile and each take a hand and walk away, followed by the monks. The dealer stands looking at the money in his hand, and then laughs.*

Dealer. What peculiar people these Christians are, to spend good gold upon a fancy such as this!

[*He puts the money in his bag and goes out laughing.*

SCENE II.—THE QUEEN'S ROOM IN THE COURT OF ETHELBERT.

[*Saxon soldiers are standing on guard; Bertha seated with her ladies. They are talking together, when Ethelbert enters, followed by his nobles. The soldiers salute with their weapons, and the ladies rise and make respectful obeisance to the king. Bertha rises, and moves forward to meet the king, who is returning the salutes of his subjects.*

Ethelbert. [*To Bertha*] Nay, lady, be seated. I have but come to ask a question.

[*He takes Bertha by the hand and leads her back to the seat, and when she is seated, takes his place by her side.*

Bertha. [*Turning to Ethelbert*] Your presence is welcome, my lord, for we had but tired one another with light gossip. [*Turning to her ladies*] Perhaps you would seek the latest news from our gentle friends yonder.

[*The ladies move away to mingle with the courtiers. They form little groups about the hall, and commence to talk together, leaving Ethelbert and Bertha seated alone. Bertha turns to the king.*

Bertha. And now, Ethelbert, what is this question?

Ethelbert. Bertha, knowing that you still remain true to the Christian faith, I wished to know if you had heard of this stranger who has landed on our coasts?

Bertha. [*Eagerly*] Of what stranger do you speak?

Ethelbert. One who has come without spear and shield among a warlike people; a stranger among those who do not love strangers; a preacher of a new faith to persons who remain faithful to those gods whom we have worshipped for many years; one who prates of peace to men of war.

Bertha. [*Rising with excitement*] A preacher, my lord?

Ethelbert. Yes, and of your own faith; and for your sake I would not see him come to harm. A brave man, by Thor, to dare so to come among us!

Bertha. [*Placing her hand on Ethelbert's arm*] My lord, I thank you for your kindness. Why is it that so good a heart cannot be made to accept the truth? Am I less good in that I am a Christian? Oh, my husband, my lord, my king, give protection to this priest, and listen to his words.

Ethelbert. [*Impatiently*] Lady, worship as you will, but for mine own part I need no more gods than I have to-day. Have I not one to pray to for each passion or pleasure that sways me?

Bertha. [*Seating herself slowly and sorrowfully*] Alas! it is true. There are gods for all things but peace.

Ethelbert. [*Laughing*] Why should there be such a god, when we do not desire such a thing? Beauty and strength, endurance and valour, these we admire, but peace is for little children and clinging women. What would brave men do in a peaceful land?

Bertha. Yet you say this stranger preaches peace. Is he less a man. Did you not call him brave?

Ethelbert. [*Rising quickly, and walking impatiently to and fro*] Enough, Bertha; I have no wish to argue with you. Are we to lose Valhalla and become women at the bidding of a stranger? If only I knew how to be certain, none would be more happy than I. But a new god would only make my doubts greater.

Bertha. [*Rising and going to him*] Let me at least give protection to this priest, and find some safety for him.

Ethelbert. Have your wish, lady; but do not try to pledge me to hear his words. [*Turning to his nobles, and raising his voice*] Come, friends, let us leave these fair ones to the peace they so much desire.

[*Once again all salute the king as he goes out, followed by his nobles, laughing. The ladies gather round Bertha, who beckons one to her.*

Bertha. See that a messenger be sent to this wandering priest, and bid him come to us, for we have fears for his safety.

[*The lady goes out, and once again the other ladies seat themselves round the queen, and continue their conversation.*

SCENE III.—ETHELBERT'S CAMP. THE COMING OF AUGUSTINE.

[*Ethelbert and Bertha seated; courtiers, ladies, and soldiers standing or lying about in comfortable positions on the grass. Enter Augustine, followed by monks, one carrying a cross, others holding roughly-painted pictures which are fixed at the end of poles. They walk slowly forward, until they stand but a few paces away from the king. All the people look towards them attentively and curiously, whilst Bertha runs forward and kneels at the feet of Augustine, who places his hand gently upon her head, and then lifts her to her feet.*

Augustine. Rise, lady, for it is not fitting that a queen should kneel at my feet.

Ethelbert. [*Stepping forward, and leading Bertha to her seat*] [*Aside*] Bertha, restrain yourself. Our people do not understand your creed, and your act appears but a folly in their eyes. [*Bertha seats herself, and Ethelbert turns to Augustine*] We have given you our protection, and it is our desire to hear that which you have to say.

Augustine. [*Taking the cross in his hands*] I thank you for your kindness, O king! Bear with me a little longer, and I will deliver the message which my Master has sent me to give.

Ethelbert. Speak on, and we will hear your message. [*Turning to the people*] Have patience, my people!

A Noble. We will have patience, my lord.

Augustine. I am from Rome, whence my master, Gregory, has sent me. By his orders I am come to this land to do my poor best to tell the people the story of my suffering Lord. [*Here he points to one of the pictures.*] But, perchance, you may like to know why my master sent me to this land?

Bertha. [*Eagerly*] Yes, father, tell us the reason.

Augustine. One day, whilst walking in Rome, he noticed two little boys standing in chains, so sweet-looking that he asked the dealer from what land they came. The reply was, "From Angleland." And after my master had questioned the dealer, he bought the lads, who had been captured in one of the many battles in which your people are always engaged. Poor, innocent children! they had to suffer for the cruelty and wickedness of their elders.

Ethelbert. [*Angrily*] These are bold words to address to us.

Augustine. [*Quietly*] Nay, there is no boldness in speaking that which is true. You live by war, and do not try to understand its miseries. You are strong, and do not care for the wrongs done to the weak. For every victory you gain, although honour comes to you, death comes to many men, misery to many women, and slavery to little children.

Bertha. [*Turning to Ethelbert*] My lord, this is very true.

Ethelbert. It may be so, but how can it be altered?

Augustine. Teach the people of a God of mercy, who hates wrongdoing and wickedness, who shows pity to the poor and humble and helps the weak. Turn from those false gods who encourage vice and passion, and give glory to the only true and living God. Thus will you end this state of lawlessness.

A Noble. [*Stepping forward*] What you say has the sound of truth, but among the many gods how can you be sure that He whom you worship is the only true God?

Augustine. [*Taking the picture of the Crucifixion*] Listen to the story of my Lord and Master, Christ!

2nd Noble. [*Stepping forward also*] We will; for the life of man is but as a journey in the dark. It endures but for a little, and what has gone before or what will follow after we know not. [*Turning to the king*] My lord king, if this stranger can tell us anything that we may know whence a man comes and whither he goes, let us hear him and follow his doctrine.

Ethelbert. [*Rising*] I would fain hear more of his words. [*Turning to Augustine*] Can you tell us these things?

Augustine. Yea; but the tale is long, and many days must pass before you will understand.

Ethelbert. Life is short; but if we can settle these doubts which press upon our minds, the time will be well spent. [*Turning to the people*] Treat these strangers well and with all gentleness, for we would hear more of their beliefs. [*To Augustine*] Friends, follow me.

Augustine. We thank thee, lord.

[*Ethelbert and Bertha rise and go out, followed by the monks. The others stand talking together, discussing what has happened, and then pass out in different directions.*

Blackboard Sketch.

1. The Christian faith was known to the British.
2. The Saxons drove out the Britons and worshipped their own gods.
3. Christianity was reintroduced through—
   (*a*) Gregory seeing the Saxon slave-boys in Rome.
   (*b*) Augustine coming to Angleland to preach.
   (*c*) The conversion of the Saxon king, Ethelbert.
4. Augustine became the first Archbishop of Canterbury.

SINGER CATHEDRAL VIEWS.

THE Singer Sewing Machine Company, Limited, request us to say that they have had thousands of applications for the second series of their Cathedral Views, and ask us to state that this second series is now in print, and will be sent to applicants as soon as ready, which will be some time towards the end of the year. Any of our readers not having had the first series are requested to make early application to Singer Sewing Machine Company, Limited, 42 and 43 St. Paul's Churchyard, London, E.C., as there is still a small supply left.

SCRIPTURE LESSONS FOR YOUNG CHILDREN.

THE STORY OF JESUS—*Continued.*

BY MRS. FLORENCE KIRK.

2. THE MINISTRY OF JESUS: THE FIRST DISCIPLES.

Introduction.—The teacher should begin by revising the previous lesson on the baptism of Jesus by John the Baptist (see September number), and then proceed with the story as follows:—

Jesus begins His Ministry.—After listening to the preaching of John, and being baptised by him, Jesus decided henceforth to devote His undivided powers to the service of God and His fellow-men. In order to think out His future plan of action, and to commune with His heavenly Father, He retired into the wilderness, where He could be quite alone. He felt that God had given Him a *new* message to deliver to his fellow-men—a gospel of love.

In the solemn silence of the night He fully realised the tremendous fight that He would have to wage, and

THE FIRST DISCIPLES.
(From Nelson's Bible Wall-Pictures.)

the suffering and pain He would have to undergo, as the bringer of a new gospel; but nothing could shake His determination.

When He had settled everything within Himself, He returned once more to the river Jordan, to Bethabara, where John was baptising (John i. 28). On seeing Him, John exclaimed, "Behold the Lamb of God, which taketh away the sin of the world." The next day he saw Jesus again, and once more exclaimed, "Behold the Lamb of God." Only two persons were standing near him at the time, and overheard his remark. These were Andrew and John, natives also of Galilee; and they immediately followed Jesus, who, on hearing their footsteps, turned round and asked if they wanted Him. They addressed him as Master (Rabbi), and asked if they might come with Him. He answered them, "Come and see." They came and saw where He

dwelt, and abode with Him that day; for it was about the tenth hour.

Here the teacher should draw a mental picture of that lowly dwelling: a humble, whitewashed room, with a clay floor; the window simply a hole through the outer wall, without glass, lattice, or curtain; a low bench or divan running round the room to serve for shelf, chair, couch, and bed. Get the children to close their eyes and see the room in imagination. Make a rough model in clay or plasticine, and say that such rooms are still to be seen at the present time in that country.

Sitting in this quiet room, Jesus tells them His message, which so impresses them that they beg to be allowed to come with Him. Andrew goes to seek his brother Simon, and brings him to Jesus. Jesus declares that he shall be called Cephas, or Peter, which means a rock or stone.

Here show the picture, which may be explained as follows: Jesus is walking by the banks of the river, and sees a boat approaching containing Andrew and

THE FIRST MIRACLE.
(From Nelson's Bible Wall-Pictures.)

his brother Simon, both of whom were fishermen. Andrew has been to fetch his brother, and, on seeing the Master, stands in an attitude of reverence. Draw the children's attention to the sunset glow and the shadows on the water, the shadows on the opposite shore, the building on the bank, the furled sail, etc.

The next day Jesus, with John and the two brothers—Simon, or Peter, and Andrew—set out to return to Galilee, and on the way overtake Philip, another native, who also joins their band. Philip then goes in search of his friend Nathanael, to whom he speaks enthusiastically about the new Teacher. Nathanael will not believe that any such person can have come from Galilee, but eventually is persuaded to come and hear Him, and at once becomes one of His followers.

The First Miracle.—On the third day after setting out, Jesus and His five followers, called disciples, reach a little village not far from Nazareth, called Cana. (Here refer to the map, and indicate its position. See September number.)

A marriage feast was about to be celebrated, at which Mary, the mother of Jesus, was to be present. Jesus and His five followers were also invited; and this increasing the number of guests very considerably, the supply of wine ran short. (Reference should here be made to the custom of drinking the juice of the grapes, which were so abundant.) Mary called the attention of Jesus to this fact, and Jesus rebuked her for assuming that He had any power to remedy it. "Woman, what have I to do with thee? mine hour is not yet come." Mary, however, instructed the servants to obey any commands that He might give. "Whatsoever he saith unto you, do it." Several large waterpots of stone were standing near, which had contained the water for the guests to use in washing, after the custom of the country.

Jesus told the servants to fill these with water, and they filled them to the brim. Then He told them to draw the liquid from the jars and to take it to the governor of the feast, and they did so. When the ruler of the feast tasted it, he called the bridegroom, and remarked that usually the best wine was served first and the poorer kind last, but that in this case the best wine had been kept till the last. He, of course, was not aware that the wine was from the jars which Jesus had commanded to be filled with water. This incident made the disciples believe in Him more than before, and spread His fame abroad in the neighbourhood.

The teacher, after telling the story in her own words, should, when possible, read the narrative in the words of the Bible as an introduction to good native English. After hearing the story, the children will have no difficulty in pointing out the various items in the picture. Attention should be called to the dress of the various persons, the shape of the jars—these could be imitated in clay or plasticine—the feast-table. Reference should be made to the customary food of the country.

NELSON'S

FIRESIDE LIBRARY.

A NEW and highly-attractive series of Gift Books for younger children who have just learned to read. Large type. Beautifully illustrated. Each with eight plates in full colour, and numerous marginal pictures of a charming and original character.

NOW READY.

Each 112 pages. Cloth. Price 1s. 6d.

FUNNY FOLKS. Tales taken from home folk-lore.

BUSHY-TAIL. Charming nature stories with a human interest.

LITTLE SNOWDROP and other tales from Grimm.

NEVER-NEVER-LAND. Simple poems and rhymes.

THOMAS NELSON AND SONS,
LONDON, EDINBURGH, DUBLIN, AND NEW YORK.

Our Query Column.

Solutions by A. Clement Jones, M.A., Ph.D., Senior Mathematical Master, Bradford Grammar School.

RULES.

1. Each correspondent is restricted to *one* question.
2. Each query must be accompanied by the name and address of the correspondent, and the *coupon* which appears on the back wrapper of the current number of the Journal.
3. Correspondents must in all cases state the source from which their query has been obtained.

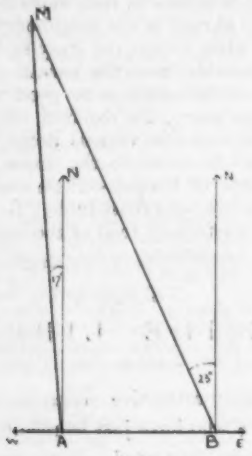
The Editor reserves to himself the right to decline to answer any question which is, in his judgment, unsuited to the Magazine.

Weary Willy.—In order to determine the height of a mountain a base line AB, 1,000 feet long, is measured along a road running east and west. The bearings of the summit from the ends A and B of the base line are respectively N. 17° 20′ W. and N. 23° 14′ W., while the elevation of the summit from the point A is 7° 26′. Prove that the height of the mountain is about 1,166 feet. What is the elevation of the summit as observed from B? (Liverpool Univ. Inter. B.A., 1910.)

The figure is a ground plan, M being the vertical projection on the horizontal plane of the summit of the mountain. The data correspond to

$$\angle ABM = 66° 46′; \ \angle BAM = 107° 20′.$$
$$AM = h \cot 7° 26′,$$

where h feet is the height of the mountain.



The angle $AMB = 180 - 107° 20′ - 66° 46′ = 5° 54′$,

hence $$\frac{h \cot 7° 26′}{\sin 66° 46′} = \frac{1000}{\sin 5° 54′} = \frac{h \cot \beta}{\sin 107° 20′},$$

where β is the elevation of the summit of the mountain at B.

Thus

$$\log h = 3 + \mathrm{L}\sin 66° 46′ + \mathrm{L}\sin 5° 54′ - \mathrm{L}\cot 7° 26′ + 10$$
$$= 13 + 9{\cdot}96327 - 9{\cdot}01196 - 10{\cdot}88449$$
$$= 3{\cdot}06682.$$
$$\therefore \ h = 1166{\cdot}3 \text{ feet.}$$

Also

$$\mathrm{L}\cot \beta = 13 + \mathrm{L}\sin 107° 20′ - \mathrm{L}\sin 5° 54′ - \log h$$
$$= 13 + 9{\cdot}97982 - 9{\cdot}01196 - 3{\cdot}06682$$
$$= 10{\cdot}90104.$$
$$\therefore \ \beta = 7° 10′.$$

Comus.—An ellipse of small eccentricity has its perimeter equal to that of a circle of radius a. Show that its area is $\pi a^2\left(1 - \frac{3}{32}e^4\right)$ nearly. (Edwards's *Integral Calculus*.)

If p be the perpendicular from the centre of the ellipse on a tangent, and ψ the angle p makes with the axis of x, we have

$$p^2 = \alpha^2 \cos^2 \psi + \beta^2 \sin^2 \psi$$
$$= a^2 (1 - e^2 \sin^2 \psi),$$

where α, β are the semiaxes of the ellipse. Hence

$$p = a(1 - e^2 \sin^2 \psi)^{\frac{1}{2}} = a - \frac{ae^2}{2}\sin^2 \psi - \frac{ae^4}{8}\sin^4 \psi,$$

omitting powers of the small quantity e above the fourth.

Thus

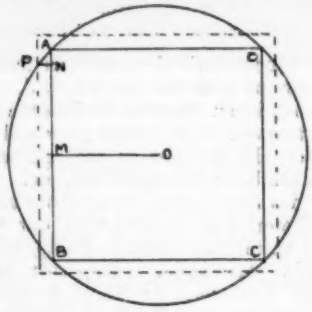
$$\int_0^{2\pi} p\,d\psi = 2\pi a - \frac{ae^2}{2}\int_0^{2\pi} \sin^2 \psi \, d\psi - \frac{ae^4}{8}\int_0^{2\pi} \sin^4 \psi \, d\psi.$$
$$\therefore \quad 2\pi\alpha = 2\pi a - \frac{ae^2}{2} \cdot \pi - \frac{ae^4}{8} \cdot \frac{3\pi}{4}.$$
$$\therefore \quad \alpha = a\left(1 - \frac{e^2}{4} - \frac{3e^4}{64}\right).$$
$$\therefore \quad a = \alpha\left(1 - \frac{e^2}{4} - \frac{3e^4}{64}\right)^{-1} = \alpha\left(1 + \frac{e^2}{4} + \frac{7e^4}{64}\right).$$

The area of the ellipse

$$= \pi\alpha\beta$$
$$= \pi\alpha^2(1 - e^2)^{\frac{1}{2}}$$
$$= \pi\alpha^2(1 - e^2)^{\frac{1}{2}}\left(1 + \frac{e^2}{4} + \frac{7e^4}{64}\right)^2$$
$$= \pi\alpha^2(1 - \tfrac{1}{2}e^2 - \tfrac{1}{8}e^4)\left(1 + \frac{e^2}{2} + \frac{9e^4}{32}\right)$$
$$= \pi\alpha^2\left(1 - \frac{3e^4}{32}\right) \text{ nearly.}$$

E. Hann.—A circular table weighing 20 lbs. is supported by vertical legs attached to four points of the rim, forming a square. Find from what parts of the rim a hundredweight can be hung without overturning the table.

If the table tilts, it must do so about two legs, hence in the limiting positions, when the table is on the point of tilting, the pressure of the floor on the two legs will be zero, and the moments of the weights of the table and suspended mass about the line joining the feet of the other legs (AB in



the figure) must be equal and opposite—that is,

$$112 \times PN = 20 \times OM.$$
$$\therefore \quad PN = \frac{20}{112} \cdot OM$$
$$= \frac{5}{28} OM.$$

The mass can occupy any position nearer AB than P—in other words, since the same is true for the segments BC, CD, AD, P can lie anywhere on the rim within a square whose side is $1\frac{5}{28}$ of AB situated symmetrically with ABCD.

Beaten.—A pillar, free to move smoothly up and down, is raised by a wedge of angle i and negligible weight driven by a horizontal force. If the coefficient of friction between the pillar and wedge, and also between the wedge and ground, be equal to μ, show that the mechanical advantage is

$$(\cos i - \mu \sin i)/(2\mu \cos i + (1 - \mu^2) \sin i),$$

and find the efficiency. (London Inter. B.Sc., 1910.)

The figures indicate the forces acting on (1) the pillar, (2) the wedge.

Resolve vertically for the pillar, to avoid the reactions of the supports,

$$W = R \cos i - \mu R \sin i. \quad . \quad . \quad . \quad . \quad . \quad (i)$$

Resolve horizontally for the wedge,

$$P = \mu x + R \sin i + \mu R \cos i. \quad . \quad . \quad . \quad (ii)$$

Resolve vertically for the wedge,

$$x = R \cos i - \mu R \sin i. \quad . \quad . \quad . \quad . \quad . \quad (iii)$$

From (ii) and (iii), substituting for x,

$$P = 2\mu R \cos i + (1 - \mu^2) R \sin i. \quad . \quad . \quad (iv)$$

Dividing corresponding sides of (i) and (iv),

$$\frac{W}{P} = \frac{\cos i - \mu \sin i}{2\mu \cos i + (1 - \mu^2) \sin i}. \quad . \quad . \quad . \quad (v)$$

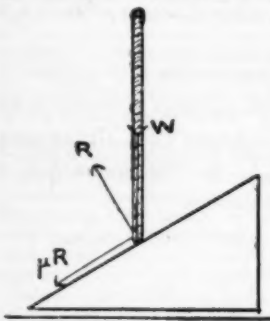


Fig i

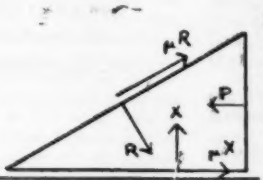


Fig ii

Now if the wedge advances a distance s, the pillar is raised a height $s \tan i$.

Hence, when Ps units of work are expended, $Ws \tan i$ units of useful work are done. Hence the efficiency of the machine is $\frac{W}{P} \tan i$, where $\frac{W}{P}$ has the value given in (v).

Stile Cop.—Find the points of inflexion upon

$$12y = x^4 - 16x^3 + 42x^2 + 12x + 1.$$

At a point of inflexion we have $\frac{d^2y}{dx^2} = 0$.

Now $$12\frac{dy}{dx} = 4x^3 - 48x^2 + 84x + 12,$$

and $$12\frac{d^2y}{dx^2} = 12x^2 - 96x + 84.$$

Hence at points of inflexion

$$x^2 - 8x + 7 = 0;$$

that is, $$(x - 7)(x - 1) = 0;$$

that is, $$x = 1 \text{ or } 7.$$

These are points of inflexion provided $\frac{d^3y}{dx^3}$ does not vanish at them, but

$$12\frac{d^3y}{dx^3} = 24x - 96 = 24(x - 4),$$

and therefore does not vanish at these points.

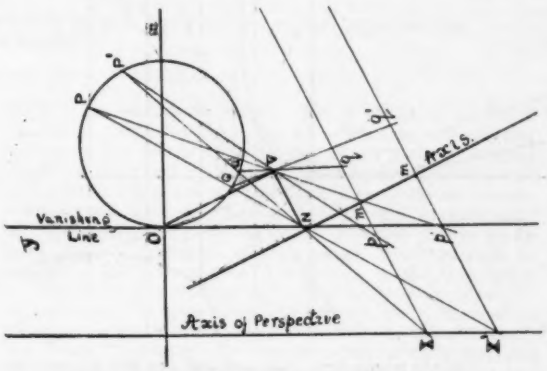
If $$x = 1, \; y = 3\tfrac{1}{4},$$

$$x = 7, \; y = -78\tfrac{3}{4};$$

that is, the required points are $(1, 3\frac{1}{4})$ $(7, -78\frac{3}{4})$.

Provost.—If the pole of perspective be $(1, -2)$, the axis of collineation $x = -2$, construct the axis of the parabola in plane perspective with the circle $x^2 + y^2 - 3x = 0$, the vanishing line for the circle being $x = 0$.

Call the origin of co-ordinates O, the point $(1, -2)$ V. Join VO. Now the axis of y touches the circle at O, and is the vanishing line. Hence it projects into the line at infinity, touching the parabola. O projects into the point at infinity on VO, hence VO is parallel to the axis of the parabola. Draw VN perpendicular to VO to meet the vanishing line at N, then the tangent from N to the circle projects into the tangent at the vertex, for its projection is a line parallel to VN through its intersection with the axis of collineation. The centre of perspective is so placed that this method of proceeding is not practical, VN nearly coinciding with this tangent.



Draw any chords NQP, NQ'P' of the circle.

Let NQP meet the axis of perspective at X. Since X corresponds to itself, and N to the point at infinity on VN, the line Xpq parallel to VN corresponds to XPQ. Then VP, VQ meet Vpq at the points p, q which correspond to PQ.

Since pq is perpendicular to the axis, its mid-point m lies on the axis.

We have drawn also the chord $p'm'q'$ perpendicular to the axis to verify our construction.

The line mm' is the axis and is parallel to VO.

Nomen.—The diagonal and the longer side of a rectangle are together five times the shorter side, and the longer side exceeds the shorter by 35 yards. What is the area of the rectangle?

Let the lengths of the longer side, shorter side, and diagonal be a, b, and d yards respectively. We are given that

$$d + a = 5b \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (i)$$

$$a = b + 35 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (ii)$$

and we know by Pythagoras's Theorem that

$$d^2 = a^2 + b^2 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (iii)$$

Combining (i) and (ii), we see that

$$d = 5b - a = 5b - (b + 35) = 4b - 35,$$

and so (iii) gives

$$(4b - 35)^2 = (b + 35)^2 + b^2.$$

$$\therefore \quad 16b^2 - 280b + 35^2 = b^2 + 70b + 35^2 + b^2.$$

$$\therefore \quad 14b^2 - 350b = 0.$$

$$\therefore \quad b(b - 25) = 0.$$

$\therefore$ since b is not $= 0$, we have $b = 25$ yards, and (ii) gives $a = 25 + 35 = 60$ yards.

$\therefore$ area of rectangle $= a \times b$

$$= 60 \times 25.$$

$$= 1500 \text{ square yards.}$$

François.—The axes of co-ordinates being rectangular, rays $x = 1$, $x = 2$, $x = 4$ of a cylindrical pencil, whose vertex is at infinity on the axis of y, correspond to the rays $y = x$, $y = -x$, $y = -\frac{1}{2}x$ respectively of a projective (that is, homographic) pencil whose vertex is the origin.

Draw the locus of intersections of corresponding rays of the pencils and the ray of the first pencil which corresponds to $x = 0$ of the second pencil. (B.Sc., London, 1909.)

Name the rays as follows:—

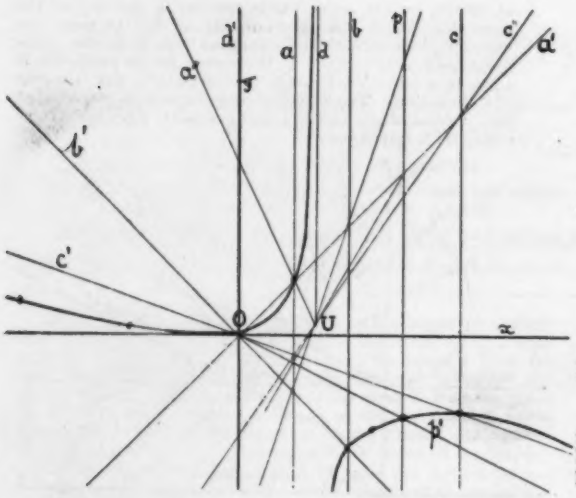
$$a \equiv x - 1 = 0; \; a' \equiv y - x = 0.$$

$$b \equiv x - 2 = 0; \; b' \equiv y + x = 0.$$

$$c \equiv x - 4 = 0; \; c' \equiv 3y + x = 0.$$

$$d' \equiv x = 0.$$

And call the intersection of the rays a and b' the point (ab').



Join the points (ba'), $(b'a)$, and call the join b''; join the points (ca'), $(c'a)$, and call the join c''. Let $b''c''$ meet at U.

We pass from the ray b to the ray b' as follows:—

Find the point (ba'); join this point to U; let this line cut a and join the point of intersection to O. This last join is b'.

Similarly, if we take any ray d of the first pencil, find (da'). Join to U. This meets a at (ad'), which joined to O gives d'.

Evidently d' corresponds to the line joining U to the vertex of the first pencil—that is, a line parallel to the axis of y.

Several points, such as (b, b'), (p, p'), have been so constructed, and the locus is the hyperbola shown.

Widower.—Show that if the area lying within the cardioid

$$r = 2a(1 + \cos\theta),$$

and without the parabola

$$r(1 + \cos\theta) = 2a,$$

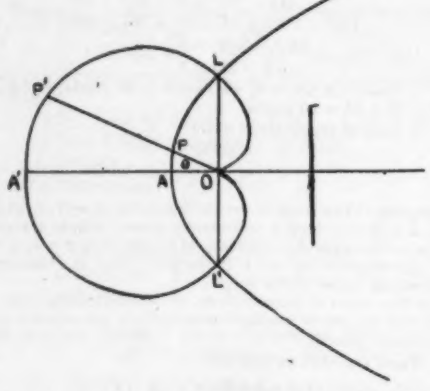
revolves about the initial line, the volume generated is $18\pi a^3$.

(Edwards's *Calculus*.)

Consider an infinitesimal sector whose vertex is the focus O, and whose base is an element of the arc of the cardioid at P'; its centre of gravity is two-thirds the way along OP'. Hence when the sector revolves about the line OA' it describes a solid whose volume is (Pappus's Theorem)

area of sector × length of path of centre of gravity

$$= \tfrac{1}{2}r^2 d\theta \times \tfrac{2}{3}\pi r \sin\theta.$$



The total volume for the cardioid is then $\frac{2}{3}\pi\int r^3 \sin\theta \, . \, d\theta$, integrated between the correct limits. Similarly for the parabola. The cardioid and parabola intersect where

$(1 + \cos\theta)^2 = 1$—that is, $\theta = \frac{\pi}{2}$.

Hence the volume generated by the revolution of the part A'ALP' about OA.

$$= \tfrac{2}{3}\pi \int_0^{\frac{\pi}{2}} a^3(1 + \cos\theta)^3 \sin\theta \, . \, d\theta - \tfrac{2}{3}\pi \int_0^{\frac{\pi}{2}} \frac{8a^3}{(1 + \cos\theta)^3} \cdot \sin\theta \, . \, d\theta$$

$$= -\frac{16\pi a^3}{3}\left[\frac{(1 + \cos\theta)^4}{4}\right]_0^{\frac{\pi}{2}} - \frac{16\pi a^3}{3}\left[\frac{1}{2(1 + \cos\theta)^2}\right]_0^{\frac{\pi}{2}}$$

$$= \frac{16\pi a^3}{3}\left\{4 - \frac{1}{4} + \frac{1}{8} - \frac{1}{2}\right\}$$

$$= \frac{16\pi a^3}{3} \cdot \frac{27}{8} = 18\pi a^3.$$

W.—See answer to "Beaten."

A new book by S. L. Loney has been well reviewed. Besant's *Dynamics* is a useful and well-established book; it includes some rigid dynamics.

François Lescuyer.—A lends B £350. B *pays* A in twenty monthly instalments of £20 each, beginning one month after the loan—that is, £400 in all. What rate of interest *per month* is B paying?

[I have added the words per month to your query. Unless the period is stated, the question is incomplete. You also failed to state the source of your query.]

The present value of all the payments to be made added together must equal £350.

Now £20 in n months at r per cent. per month compound interest becomes $\left(1 + \frac{r}{100}\right)^n$. 20. The present value of £20 . due n months hence is therefore

$$\frac{£20}{\left(1 + \frac{r}{100}\right)^n} = £20 \times x^n,$$

$$\text{where } x = \frac{1}{1 + \frac{r}{100}} = \frac{100}{100 + r}.$$

We have then the equation

$$20x + 20x^2 + 20x^3 \ldots \text{ to 20 terms} = 350.$$

$$\therefore \quad x + x^2 + x^3 + \ldots + x^{20} = 17\tfrac{1}{2}.$$

$$\therefore \quad \frac{x^{21} - x}{x - 1} = \frac{35}{2}.$$

$$\therefore \quad 2x^{21} - 37x + 35 = 0.$$

Now any value of x giving a real result must be less than unity and positive. To find such a root of the equation, let

$$f(x) \equiv 2x^{21} - 37x + 35.$$

Then evidently $f(x)$ is positive for values of x between $x = 0$ and $x = \frac{35}{37} = \cdot 946$. $\therefore$ the root required is $> \cdot 946$.

Now $f(\cdot 98) = 1\cdot 3085 - 36\cdot 26 + 35 = + \cdot 0485$,

$f(\cdot 99) = 1\cdot 61946 - 36\cdot 63 + 35 = - \cdot 0205$.

Hence $x > \cdot 98$ and $< \cdot 99$.

$f(\cdot 985) = 1\cdot 45628 - 36\cdot 445 + 35 = + \cdot 01128$.

Hence $x > \cdot 985$.

$f(\cdot 987) = 1\cdot 51948 - 36\cdot 519 + 35 = + \cdot 00048$,

$f(\cdot 988) = 1\cdot 55212 - 36\cdot 556 + 35 = - \cdot 00388$.

Hence x lies between $\cdot 987$ and $\cdot 988$, and is nearer the former.

Take $x = \cdot 987$, then

$$r + 100 = \frac{100}{\cdot 987} = 101\cdot 31.$$

$$\therefore \quad r = 1\cdot 31.$$

So that the rate charged is approximately 1·31 per cent. per month.

Preparatory Arithmetic. By *F. C. Boon.* (*Mills and Boon.*)

This is a book designed for lower forms of secondary schools, which would also afford excellent practice for boys in the highest class of the primary school. It covers the usual course, is well printed and strongly bound, and up-to-date without being eccentric. Throughout the book the greatest importance is attached to preliminary estimates and to checks and verifications.

French Prize Competition.

1. All French translations **must be received not later than November 7, 1910**, and addressed to:—PRIZE EDITOR, Office of *The Practical Teacher*, 35 and 36 Paternoster Row, London, E.C.
2. Competitors should cut out and send the *coupon* which appears on the Back Wrapper page of the current number. One coupon must be sent for each entry.
3. Competitors should write pseudonym only on MS. Prize-winner will be asked to send name and address for publication.
4. No competitor may take the prize offered more than once in three months.

A Prize of **Half a Guinea** is offered for the best rendering into English of the following extract:—

Au fond, quand je m'étudie, j'ai en effet très peu changé ; le sort m'avait en quelque sorte rivé dès l'enfance à la fonction que je devais accomplir. J'étais fait en arrivant à Paris ; avant de quitter la Bretagne, ma vie était écrite d'avance. Bon gré, mal gré, et nonobstant tous mes efforts consciencieux en sens contraire, j'étais prédestiné à être ce que je suis, un romantique protestant contre le romantisme, un utopiste prêchant en politique le terre-à-terre, un idéaliste se donnant inutilement beaucoup de mal pour paraître bourgeois, un tissu de contradictions. Une de mes moitiés devait être occupée à démolir l'autre, comme cet animal fabuleux de Ctésias qui se mangeait les pattes sans s'en douter. C'est ce que ce grand observateur, Challemal-Lacour, a dit excellemment : "Il pense comme un homme, il sent comme une femme, il agit comme un enfant." Je ne m'en plains pas, puisque cette constitution morale m'a procuré les plus vives jouissances intellectuelles qu'on puisse goûter. Ma race, ma famille, ma ville natale, le milieu si particulier ou je me développai, en m'interdisant les visées bourgeoises et en me rendant absolument impropre à tout ce qui n'est pas le maniement pur des choses de l'esprit, avaient fait de moi un idéaliste, fermé à tout le reste. L'application eût pu varier ; le fond eût toujours été le même. La vraie marque d'une vocation est l'impossibilité d'y forfaire, de réussir à autre chose que ce pour quoi l'on a été créé. L'homme qui a une vocation sacrifie tout involontairement à sa maîtresse œuvre. Des circonstances extérieures auraient pu, comme il arrive souvent, dérouter ma vie et m'empêcher de suivre ma voie naturelle ; mais l'absolue incapacité où j'aurais été de réussir à ce qui n'était pas ma destinée eût été la protestation du devoir contrarié. Toute application intellectuelle, j'y aurais réussi. Toute carrière ayant pour objet la recherche d'un intérêt quelconque, j'y aurais été nul, maladroit, au-dessous du médiocre. *From "Souvenirs d'enfance et de jeunesse," by* ERNEST RENAN.

RESULT OF THE OCTOBER COMPETITION.

The prize is awarded to "The Cullan." (Will "The Cullan" kindly forward name and address for publication?)

First Class.—Hélène, Gorse-blossom, Klop, Paul, J. B. J., Gottit, Southchurch, Seemar, Napoléon, E. C. M., Sapphire, Sirius, Parnassia, La Corrèze, Dunelm, Comet, Valentine, Acer, Michael, Coco, Rusticus, Dreux, L. N. R., Dot, Sieben, Classy, A Black Lily, C. Canadian, Bunnie Brighteyes, Hiawatha, Nyria, Essayez toujours, Lucille, Bilcat, Resusciti, Télémaque, Yella, Hialmar, O. I., Gand, Etudiante, Anglaise, Westward Ho, Coppertop, Pan, Lackry, Hamilcar, Siwel, Thrums, Nemo, Fatigue, W. P. F., Amateur.

Second Class.—Espérance, Portia, Marmalade, Innocence, Violet, Choc, Pips, Cymru am byth, Lewin, Leicester, Queen Mab, Toto, Teeny, Essex, Masque, Vic, Taffy, Irish Colleen, Tactical Preacher, Holt, Cleeve, Student Teacher, Llandogo, Cariad.

The name and address of "Traducteur," who gained the prize in last month's competition, are:—Miss E. Holdsworth, 31 Rochdale Road, Halifax, Yorks.

REPORT.

The piece set was not in itself difficult, but it required for its entire comprehension a little preliminary knowledge which some candidates lacked. Many works of antiquity became in part or wholly lost to us because the original writing on the manuscripts was entirely or partially scraped away, and the parchment written over again. This explains both *gratteurs de manuscrits* and *sous quelque antienne insipide. Gratteurs* was by many translated "defacers," "mutilators," or "destroyers," and *sous* as "in." *Parentes* was in many cases, with a disregard of chronology, mistranslated as "parents" or "forerunners." Referring to the translation of *hautes antiquités*, we may say in English "high antiquity;" but perhaps "remote antiquity" would be a translation whose meaning would be less liable to be misconstrued. We thank "Rusticus" for his letter, which fully explains his sending two papers last time. As some candidates had acted in a similar way before, without the good reason "Rusticus" has furnished, we thought it advisable to call attention to the practice of sending two papers.

PRIZE TRANSLATION.

A great hatred arose against the spoilers of antiquity, the burners, the erasers of manuscripts. The burning of a million volumes, which took place at Granada after the conquest, seemed a huge crime against reason and against God. Did Cardinal Ximenes, by printing the Bible in five languages, atone for the eighty thousand manuscripts he had burned with his own hand? Each time a word of the great lost authors was discovered under some spiritless anthem, a hundred curses were poured upon that crime, that robbery of the human race, that irreparable curtailment of its patrimony. Often the beginning of a line suggested a discovery, an idea which seemed fruitful; the elusive nymph seemed caught unawares, the eyes were fixed, until dizzy and exhausted, upon that faded trace. In vain: the desired object withdrew obstinately into the shade, the restored Eurydice fell back to the realms of gloom, and there was lost for ever. It has been said, not without likelihood, that the ancient statues, statues of marble, which have remained to our time are the poorest. The chief works of Phidias and Praxiteles were made of gold, of silver, and of ivory, and they have perished. Perhaps it is the same with the ancient manuscripts. Where are the political works that were celebrated in antiquity? And how does no trace remain of Carthage and of Syria, the close connections of the Jewish world? These would have been the true illumination of the Biblical people, whose books, so isolated in the general ruin of the Semitic tribes, remain as inaccessible as an arch of a broken bridge in the midst of a stream. Its two ends have been carried away: from neither one bank nor the other can one come at it—a ruin the more imposing, the more mysterious, that one approaches it no more. Who knows whether, in that million of oriental books which the Spaniards burned, there did not remain something of the high antiquities of Syria, of Arabia, and of Ishmael, the brother of Israel?

"THE CULLAN."

READERS of French literature ought to ask the bookseller to show them a specimen of the

COLLECTION NELSON.

Dainty editions of famous French books.

Price 1s. per volume.

Fairy Tales.*

THE LATEST METHOD OF TEACHING ENGLISH.

IT may afford some consolation to those who survey sadly what they term "the grossly materialistic tendencies of the present day" to know that England once again is undergoing subjugation by the fairies. From all the wild and moonlit corners of the world the fairies are returning from banishment.

There have been people who were willing to declare that the fairies are dead, while a few morbidly sceptical persons have even ventured so far as to assert that they never lived. Peter Pan made short work of all such rubbish, and now the fairies are coming into the country in myriads—elves, sprites, hobgoblins, and pixies.

Nobody can afford to ignore this invasion, for the cult of the fairies will soon be fashionable. They are not the simple alone, nor the simple-hearted, whom the fairies are enthralling this time. Spectacled professors are submitting without a struggle. One Oxford don is said to have adopted a particularly attractive and mischievous goblin as a pet. It is the greatest triumph of all time that the fairies have captured the schools.....

Scholars, under fairy influence, appear to have made the discovery that fairies are not such bad fellows after all. Also, they have decided that fairies, despite all ancient slanders, are quite fit for the companionship of children. The help of the fairies is to be summoned for the upbringing of the new generations. When people speak in future of "the improvement of the race," or use phrases like that, they will be thinking of fairy spells.

So it happens that with the arrival of the fairies there is the promise of a new birth of fairy literature and folk-lore. Having the fairies with us, people want to learn something about them. Children of advanced age want to find out how much they have forgotten. While as for the nursery and the schoolroom, earnest students have fastened upon the truth, so long discarded, that English fairy books are made of pure, essential English. "Truth severe, by fairy fiction drest," is to be administered by order of the education authorities.

A representative of the *Westminster Gazette* called upon a fairy publisher, and asked him all about it. "Yes," he said, "the fairies undoubtedly have come to stay. I take it that in newspaper language you would put it in that way—'They've come to stay.' The wiseacres who look after the education of your young have been mortified to observe that the last thing in the world the children have been learning is English. You listen to 'em talking in the streets, and listen to 'em when they grow up, whether they live in Mayfair or Lambeth. If it's English they're speaking, it's a quaint form of English. And do you know why it is? Well, the reason is that they started all wrong. They started with the railroad, or the motor car, or the aeroplane, instead of with the soil. These things are only accidents; the soil is *England*, or at least English soil is. And wherever there is English soil there once were fairies.

"Well, the wiseacres who manage these things have found out their mistake at last, and they have realised also that English children have wandered so far away from England that the only way to bring them back again is to call in the help of the fairies and the men and women whom fairies have inspired to write about fairies. So you will find in future that the old plan of mixing up England with history, or with geography, or with any other tiresome problem, for the benefit of babies whose only history should be happiness and whose only geography should be the nursery, the playground, and the sea-sands, will be more and more abandoned. History will have its place and its time, so will geography, but in the beginning the little ones will learn of England and fairyland.

"So far I have been speaking only as a fairy. Let me say further, as a publisher, that they will also be making their bow to Literature, and in such a pleasant, friendly fashion that in later life they will never fall out with her. And this is *happening*, you know. Fairy books, since the fairies came, have been multiplying ever so fast. They are being sought after for school books, for prize books, and for gift books. I confess I have heard of crusty people who actually say they dislike fairy tales. Because they are not *true!* But they *are* true. I ask you, sir, do you believe that little children exist? Have you ever exchanged smiles with 'em? Ever joked with 'em, and played with 'em, and teased 'em, and found out what a little you know and what a lot they can teach you?"

He had shot out these questions at a prodigious speed, but now he paused impressively, before he went on, very slowly and seriously: "Have you ever seen a youngster smile in his sleep?"

"I have done all these things," the interviewer replied, "and I *have* seen a child smile in its sleep."

"Then can you *help* believing in fairies?" said the fairy publisher.

"I cannot," the interviewer replied.

"Oh, there are the makings of a happy England," said the publisher, rubbing his little hands together. "I almost wish I were a human," he added wistfully.

* With acknowledgments to the *Westminster Gazette*.

ROYAL SOCIETY OF ARTS EXAMINATIONS.—The Programme for the 1911 Examinations of the Royal Society of Arts has just been published. It gives full information about the whole system, with much information useful to intending candidates, and a reprint of all the papers set this year. The general examinations will commence on Monday, April 3, 1911, at the 439 centres now established in various parts of the United Kingdom. The commercial subjects include:—Bookkeeping, Accounting, and Banking, Shorthand, Typewriting, Economics, Précis-writing, Commercial Law, Commercial History and Geography, Arithmetic, Business Training, Handwriting, and Modern Languages. At the same time examinations will be held in Rudiments of Music and in Harmony. The examinations are now held in three stages:—I., Elementary; II., Intermediate; III., Advanced. Medals and prizes are offered in each subject in the two higher stages. Examinations are also held in the Practice of Music, and *viva voce* examinations in French, German, Spanish, Portuguese, and Italian. Full information as to these is contained in the Programme. The total number of candidates examined by the Society during the past twelve months was 27,330.

CLOUGH'S CORRESPONDENCE COLLEGE,

TEMPLE CHAMBERS, LONDON, E.C.

The Oldest and Most Successful Correspondence College.

NEW COURSES for L.L.A. and HIGHER FROEBEL EXAMS.

FULL PARTICULARS ON APPLICATION.

****** CLOUGH'S CLASSES are the LEADING CLASSES for all Teachers' Examinations. Students need the best possible advice and assistance in preparing for their examinations. Clough's Classes provide both. To ensure success Students should join Clough's Classes.***

For Prospectus, Syllabus, Plan, Terms and full particulars of any of CLOUGH'S CLASSES—

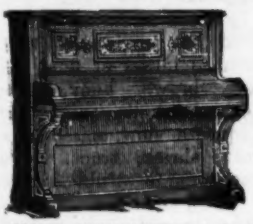
PRELIMINARY CERTIFICATE, CERTIFICATE, MATRICULATION, OXFORD AND CAMBRIDGE LOCALS, A.C.P., L.L.A., AND HIGHER FROEBEL, write to—

The Secretary, CLOUGH'S CORRESPONDENCE COLLEGE, Temple Chambers, London, E.C.

28 Years' Trading!

THE EDUCATIONAL MUSICAL INSTRUMENT COMPANY

(J. W. MORTON, Manager),



18 & 19 Highbury Place, LONDON, N.; and 21 Argyle Crescent, PORTOBELLO, EDINBURGH.

MANY THOUSANDS of Teachers, School Managers, etc., including over **Thirty of H.M. Inspectors of Schools,** are using and recommending our Instruments, of which we have specimens **in every County of the British Isles.**

We pay carriage, give a month's free trial, a ten years' warranty, and **exchange free of cost** if the instrument sent is not all that is desired.

See our **45 Guinea** Prize Medal Upright Iron Grand Piano for **£21 cash,** or thirty-six payments of 13s. 5d. per month. Quite new, rich, full tone, and thoroughly durable.

CYCLES, CAMERAS, & FURNITURE
on special terms.

Dr. MACNAMARA, M.A., M.P., writes: "We are more than delighted with the Piano which you recently selected for and supplied to us. Any of my friends who need an instrument cannot possibly do better than place themselves entirely in your hands."

Sir J. H. YOXALL, M.A., M.P., Gen. Sec. N.U.T., writes: "For the fourth time I have experienced, for myself or for relatives, the special value, wide selection, and expert advice which your clients gain. Each of the four Pianos has given perfect satisfaction."

Showrooms open daily. Write for our List, specifying the class preferred.

WE CAN SAVE YOU MANY POUNDS.

(Please mention this Paper.)

NOW READY.

HIGHROADS OF GENERAL HISTORY

Being Volume IX. of Messrs. Nelson's Famous Series "Highroads of History."

334 Pages, Cloth Boards. Price 2s.

This book is designed to meet the demand for history books for older pupils which take a wider view of the subject. The writer, Miss E. M. Wilmot-Buxton, deals in turn with each of the great world empires from the time of the Pharaohs to that of the British Empire. The book contains Sixteen Coloured Plates, and a large number of black-and-white illustrations, including numerous marginal cuts.

THOMAS NELSON AND SONS,

35 and 36 Paternoster Row, London, E.C.; Edinburgh, Leeds, Dublin, and New York.

THE TEACHER AND THE ART OF CORRECT SPEECH.

BY HERBERT LEATHER.

ALTHOUGH the majority of educated English-speaking people hold the opinion with Grimm that "the English language possesses a veritable power of expression and comprehension unsurpassed by any other language on earth, ancient or modern," it is doubtful whether the same precision of expression is practised in speaking the language as in writing it.

The difference is probably caused in part by the fact that written composition always demands some measure of concentrated thought from the composer, while speech represents thought expressed with less deference to the exact meaning of words. Though there are many notable exceptions, it seems a general practice for spoken English to be more slovenly than written English. Kingsley expresses this idea in no uncertain fashion: "Sadder and sadder Lancelot tried to listen to the conversation of the men around him. To his astonishment he hardly understood a word of it. It was half-articulate, nasal, guttural, made up almost entirely of vowels like the speech of savages. He had never been struck before with the significant contrast between the sharp, clearly-defined articulation, the vivid and varied tones of the gentleman, when compared with the coarse, half-formed growls, as of a company of seals, which he heard around him."

To no other professional body is it more vitally important to attain a correct habit of speaking than for the teachers of our children, and probably no teacher is ever vividly conscious of personal lapses from correct speech, be they ever so glaring. And yet the possession of a good voice and correct style is absolutely essential in speaking, reading, singing, and teaching.

Perfection may only be attained by sound study and training by way of careful observation and criticism. The student should follow good models, whereby that refinement in every-day speech may be acquired which comes from constant cultivation of the voice in reading and of the ear in listening. The influence of travel, wide reading, and the examples of great writers and orators are all-important factors in shaping the spoken language of the student.

Perhaps the most useful accessories of the painstaking teacher are the pronouncing dictionary and the notebook. In the latter may be placed for future reference: (1) uncommon words; (2) words commonly mispronounced; (3) words of variable pronunciation; (4) exercises in vowel and consonantal sounds; (5) common French and Latin words and phrases; (6) figures of speech; (7) abbreviations; (8) examples of common faults in pronunciation. Such a collection would prove highly serviceable in every school, as it would represent generally the chief defects of speech prevailing in the locality. Under the first heading would appear such words as sobriquet, abattoir, apropos, suffragan, turgid, triumvir, vehement, wharfinger, timbre, etc. The main function of writing down these and similar examples would be the expansion of the teacher's knowledge, though in the case of higher-grade pupils the same custom might be introduced with the idea of promoting independent study of the dictionary.

In the second class such words as the following would appear:—Abdomen, acumen, mandamus, apothegm, apotheosis, adverse, armistice, aquiline, askance, awry, accessory, authoritative, bacillus, benign, benignant, bas relief, bureaucracy, cañon, chalybeate, caviare, centrifugal, centripetal, clandestine, clerk, chimera, clematis, cynosure, coadjutor, centenary, controversy, couchant, cotyledon, connoisseur, compromise, contumacy, cognisant, consummate, cicerone, courtesy, diamond, demesne, desuetude, despicable, decorous, deceased, demoniacal, distich, emetic, egregious, emissary, encyclical, elixir, exit, eczema, espionage, executor, exegesis, extempore, ephemeral, façade, facsimile, freight, flagitious, gibbet, gist, gauge, gouge, geyser, halfpenny, heinous, herculean, hemorrhage, incubus, interesting, indict, irrefutable, irrefragable, joust, laboratory, lichen, litigious, mirage, mange, malign, mortgage, machination, naive, meteorological, orgies, obstinacy, obligatory, oust, obstreperous, pariah, plethora, precedence, phthisis, parabola, puisne, pseudonym, peremptory, prophecy, prophesy, pyjamas, polygamy, prescience, proletariat, qualm, quoit, queue, recipe, respite, revolt, repartee, rationale, salaam, slough, sycophant, splenetic, etc.

An occasional revision, *viva voce*, would prove of eminent service in extending the vocabulary upon correct bases; and in cases where external criticism of the student's methods of pronunciation is not available, assistance could be gained from a good standard dictionary. A list of words admitting of variable pronunciations would serve an excellent purpose in providing exercises for use in English literature lessons. Pupils could be called upon to use the words in different sentences according to their meanings.

Exercises in vowel and consonantal sounds are useful for both teachers and pupils. Lists, such as those following, would be deliberately pronounced aloud first by the teacher, afterwards by the scholars:—Say, bait, paper, clay, strange, swathe, eighth; calm, cast, mast, plant, staff, grant, class, laugh; ear, beer, tear, veer, pierce, near, mere, here, leer, sere; tire, lyre, sire, shire, mire; oh, snow, probe, croak, globe, coach, toast, stroke; you, hue, dew, deuce, duke, tune, tunic, new. Compounds of vowels would be noted on similar lines.

Consonantal exercises would be provided by lists arranged to their classification as initial or final consonants—thus: Initial—Black, brown, buoy, draw, dwarf, flew, frog, glean, clothes, crumb, quilt, play, prince, sphere, scald, script, squeeze, slow, small, snow, splash, sprinkle, stray, swear, shriek, trout, twine, through, thwart, etc. Final consonants—Rubbed, rubs, reached, breadth, breadths, pads, breathed, breathes, cuffs, theft, thefts, fifth, fifths, begged, begs, judged, axe, fixed, sixth, sixths, acts, bulb, bulbs, filch, filched, wild, wilds, twelfth, twelfths, bulge, bulged, elk, elks, sulked, films, fallen, help, helps, else, hilt, hilts, attempt, attempts, thousandth, thousandths, change, changed, shirks, earl, whirls, arm, armed, arms, learn, learned, learns, learnt, chirp, chirps, chirped, fierce, cask, casks, hasp, haspe, cusped, wrist, wrists, hushed, wits, eighth, eighths, baths, sheathed, halved, halves, pleased, etc.

Common French and Latin phrases, after having been once noted and their English meanings ascertained, would prove extremely useful to the teacher on account of the readiness with which such phrases could be explained when met with in the reading of the pupils. In the same way lists of abbreviations and typical figures of speech would provide valuable assistance in English literature courses.

Among common faults in pronunciation, such phrases as the following might be noted for reading aloud:—

THE PRACTICAL EDUCATION OF GIRLS

The great aim in Education is to equip the scholar for his or her future career. One of the surest means to this end in a Girl's Education is to teach her to use the

SINGER SEWING MACHINE

A TYPICAL SEWING CLASS. (From a Photograph.)

Teach the girls to sew upon a "Singer"—the Best and British Built Sewing Machine—and thus help them to earn a comfortable living after school days are over. In all the large Sewing Industries there is a steady and growing demand for women operators with a knowledge of the SINGER SEWING MACHINE.

Tens of thousands of well-paid girls are to-day busily employed in all the large Clothing and Shoe Factories sewing upon the "Singer." Throughout the entire world there are more Singer Sewing Machines in daily use than all other makes combined—indisputable evidence that the "Singer" has proved itself to be the best of all Sewing Machines.

A TYPICAL STITCHING ROOM IN A BOOT FACTORY. (From a Photo.)

SINGER SEWING MACHINES

EASY TO TEACH, EASY TO LEARN, EASY TO OPERATE.

SPECIAL TERMS TO SCHOOLS.

APPLY TO THE NEAREST SINGER SHOP—THERE ARE OVER 900 OF THEM IN GREAT BRITAIN AND IRELAND.

SINGER SEWING MACHINE CO., LTD.

Sharp point, right time, tall lady, big gun, make clean, take care, next week, first student, fifth thrust, superb bulb, firm manner, mad dog, a languid dame, fixed stars, an old ox, please prate to nobody, an ice house, told him, saw her, necessarily incurred, a supernumerary, its impracticability and unintelligibility, his disinterestedness, a laboured corollary, decisive inconsiderableness, its intercommunicability, as it was in the beginning, Ann went on in an animated manner, such individual irregularities are generally irremediable, the ineligibility of the preliminaries is unparalleled, etc.

For teachers in charge of young scholars, frequent practice in rightly pronouncing words similar to the following list is invariably followed by decided improvement in every-day speech:—Perhaps, bade, ate, fellow, pillow, window, cruel, violet, violin, violent, mischievous, ordinary, combat, listen, fasten, sugar, woman, bosom, blood, princess, idea, apostle, boatswain, coxswain, bow, rowlock, stern, topsail, mainmast, truths, baths, oaths, impious, wholly, laboratory, centenary, contrary, allies, deceased, heir, hour, honest, honour, humble, hospital, shepherd, mouths, again, leisure, knowledge, etc.

That strict care should be given to all the details of correct speech is surely a prime duty of the teacher; and to refinement in language there is no royal road.

The method of noting down errors for collective lessons has the great advantage over public correction of the erring scholar, of economising time and effort. Individual correction of faulty speech often tempts thoughtless teachers to indulge in biting sarcasm. Is not the experiment of keeping a notebook then worth trying?

THE COURSE SYSTEM IN EVENING SCHOOLS.

ALL interested in the success of evening schools should obtain and read Educational Pamphlet No. 19, recently issued by the Board of Education, and procurable through any bookseller for threepence. The prefatory note states that several local Education Authorities have in recent years successfully substituted a system of organised courses, combining in one study-plan those branches which are most requisite for the students engaged in particular industries, in place of detached courses which only lead to dissipation of energy and a loss of interest.

A higher and more liberal note is struck by the reference to the need for opportunities for the more humane studies, such as history, literature, and civics, and the like, as advocated by the Workers' Educational Association.

By the organised course system the whole of the student's time at school is treated as the unit of organisation, and schemes of work are arranged on this basis specially adapted to the needs of different industries. The essential feature is that "every student pays for the course, enters for the course, attends the course, and passes from one year of the course to another. In short, the course corresponds closely with the form of a secondary school: it and not the subject or class is the unit upon which the organisation of the school is based."

This system has of late years made rapid headway in the industrial districts of the north of England. The fundamental idea is that, for normally intelligent scholars leaving school at fourteen, a preliminary course of instruction, supplementing that received at the day school, is necessary before entering upon a course of specialised training. This preliminary course extends as a rule over two years, and is designated either the preliminary technical or preliminary commercial course, students being placed under each strictly according to their occupations. At the end of the course an examination is held, and successful students pass on to the technical or commercial course, as the case may be, there to take up engineering, building, etc., or shorthand, bookkeeping, etc.

The following diagram illustrates the system:—

Courses.		*Ages.*
Specialised Technical Courses.	Specialised Commercial Courses.	17 16
Preliminary Technical Course.	Preliminary Commercial Course.	15 14

Preparatory general Course for backward students.

An advantage is that the subjects comprised in these preliminary courses are identical in nearly all districts. For the preliminary technical course the subjects are elementary practical mathematics, practical drawing, elementary mechanics, and physics, and English composition. In the commercial course the subjects usually taken are commercial arithmetic and geography, commercial correspondence, English, and either bookkeeping or shorthand.

It has been found that the study of technological subjects cannot be isolated, and that progress in such study requires continuous attention to correlative subjects, such as mathematics, science, and drawing.

Assuming that the students can attend three nights a week, the six hours are thus accounted for:—

Preliminary Technical Course.

1st Year.	
Practical mathematics	2 hours.
Practical drawing	2 hours.
English	2 hours.
	6 hours.
2nd Year.	
Practical mathematics and drawing	3 hours.
Mechanics and physics	2 hours.
English	1 hour.
	6 hours.

Some remarkably successful results have been achieved where the course system has been worked. For instance, at Oldham the effect was to reduce the percentage of boys leaving early in the session from 52 to 24·8. In Halifax the percentage of attendance at evening schools has thereby been raised to eighty.

It has also had a most beneficial effect upon the standard and quality of the home work; and so popular is the system in Lancashire and Cheshire, that in 1909 no less than 14,900 students entered for the course certificates granted by the Union of Lancashire and Cheshire Institutes.

NEXT MONTH

An account of a visit to the Business Exhibition at Olympia by "Observer."

MESSRS. METHUEN'S NEW BOOKS

BALLADS OF THE BRAVE: Poems of Chivalry, Enterprise, Courage and Constancy. From the Earliest Times to the Present Day. By FREDERICK LANGBRIDGE, M.A., D.Litt., Canon of St. Munchin's, St. Mary's Cathedral, Limerick. Fourth and Revised Edition with Notes. Crown 8vo, **3s. 6d.**

A HISTORY OF ENGLAND FOR SCHOOLS. In Three Volumes. Vol. III. 1714 to Present Day. By ERNEST BOWYER, B.A., B.Sc. Crown 8vo, **2s. 6d.** [*New Historical Series.*

This volume has been written, on modern lines, expressly for Upper Forms of Schools. In order to enable the young historian to grasp the history of his country during the last two centuries as an intelligible whole, the economic side of England's history and the part she has played in international politics have been dealt with in greater detail than is usual in text-books written for schools.

A JUNIOR GERMAN GRAMMAR. By H. C. A. SECKLER, Senior German Master, Owen's School, E.C. Crown 8vo, **2s. 6d.** [*Junior School Books.*

This book is for the middle forms of schools, and meets the requirements of the Oxford and Cambridge Junior Local and the College of Preceptors' examinations. It consists of grammar and exercises, and a particular feature is the co-ordination of accidence and syntax. It aims throughout at training pupils to use their knowledge for composition.

HOME AND STATE: An Elementary Book on Economics and Civics. By SUSAN CUNNINGTON, Wistons School, Brighton, Author of "The Story of Arithmetic," etc. Crown 8vo, **2s. 6d.**

This book is for the upper forms in schools, and gives in simple language an account of the fundamental principles which underlie our modern economic and political conditions.

A FIRST COURSE IN ENGLISH. By W. S. BEARD. Crown 8vo, **1s. 6d.** [*Beginner's Books.*

This is a working class-book in English for the lower forms of Secondary Schools and pupils in Primary Schools. First, it provides a progressive course in analysis and elementary composition; the uses of words and their relation to each other in sentences. Second, it provides a text-book of the leading principles of grammar—accidence and elementary syntax—which will enable young pupils to apply these principles intelligently, step by step, to practical work in analysis and parsing.

STORIES FROM THE HISTORIES. Edited by E. M. WILMOT-BUXTON. With Maps. Crow 1 8vo, **1s. 6d.** each.

These volumes, by supplying a series of interesting stories, will help to remove the general complaint that English children grow up ignorant of the great events and characters in the history of other nations.

The first volumes are:—

STORIES FROM FRENCH HISTORY. By TAYLOR DYSON, M.A.
TALES FROM IRISH HISTORY. By ALICE BIRKHEAD, B.A.

STORIES FROM OLD ROMANCE. Edited by E. M. WILMOT-BUXTON, F.R.Hist. S., Author of "Makers of Europe," etc. Crown 8vo, **1s. 6d.** each.

These volumes will serve as an introduction to world literature, as well as form literary readers that will appeal to children between the ages of eight and twelve in all classes of schools. They will also be found suitable gift-books for all young lovers of stirring romance and tales of chivalry.

The first volumes are:—

STORIES FROM OLD ITALIAN ROMANCE. By SUSAN CUNNINGTON.
STORIES FROM OLD FRENCH ROMANCE. By E. M. WILMOT-BUXTON.

STORIES FROM THE GREAT WRITERS. Edited by E. M. WILMOT-BUXTON, F. R. Hist.S. Crown 8vo, **1s. 6d.** each.

In this series incidents have been selected from the works of the best writers and abridged or retold to make them appeal to children. It is hoped that these stories will kindle a love for the works of the best writers, and stimulate children to read, after school days, the originals and others by those authors. The first volumes are:—

STORIES FROM DICKENS. By JOYCE COBB.
STORIES FROM BUNYAN. By EDITH L. ELIAS.

A SHORT HISTORY OF CHEMISTRY. By T. P. HILDITCH, B.Sc. (London), A.I.C., F.C.S., 1851 Exhibition Research Scholar in the University of London. Crown 8vo, **2s. 6d.**

Primarily intended as a help to chemical students, this book will also prove serviceable to general readers who may wish to have a concise outline of the development of chemistry.

PRELIMINARY PHYSIOLOGY. By WILLIAM NARRAMORE, F.L.S., M.R. San. Inst., Lecturer in Physiology, Hygiene, Biology, and Botany, Municipal Technical School, Liverpool. Crown 8vo, **3s. 6d.** [*Text-books of Science.*

This work is adapted to meet the requirements of the Board of Education, the Oxford and Cambridge Locals (Senior), the College of Preceptors, Candidates for Matriculation, and the several examinations in Physiology held for students in Hygiene, Physical Culture, Cookery, for nurses in Probation, and students preparing for examinations in Law, Insurance, and Accountancy, where Physiology is now demanded. From the expository style and practical methods followed throughout, the work will be found well suited to private study as well as for class courses.

WRITE FOR COMPLETE EDUCATIONAL CATALOGUE TO

METHUEN & CO., LTD., 36 ESSEX ST., LONDON, W.C.

JUST PUBLISHED.

THE "A.L." INDIAN BASKET-WORK.

A Simple adaptation, for school use, of the Methods of Work and of Patterns as done by the Red Indians.

By ISABEL A. OTTY (Mrs. WILLIAMSON),
Authoress of the "K.G. Toy-Making," etc.

Crown 4to, 24 pp., with 118 Illustrations,
Net 3s. 6d.

This is a most delightful and interesting "Occupation," quite suited to the capabilities of young children in an ordinary Infant School. It is an **entirely original** Scheme of Basketry, based on the exquisite work woven by the North American Indians, and adapted by the Authoress to use in this country.

It is very **simple** and **instructive**; it **trains the hand** in **dexterity,** and the **eye** to **accurate observation of form,** while the use of Coloured Raffia in making the objects will help to **cultivate the artistic sense** of the little ones.

The Book gives complete, detailed Instructions for carrying on the work, and is fully illustrated by Diagrams and by Photographs from the actual objects.

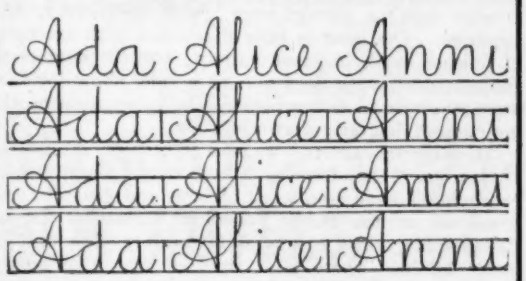
E. J. ARNOLD & SON, Ltd.,
LEEDS AND GLASGOW.

The Pioneer of Vertical Writing.

JACKSON'S UPRIGHT PENMANSHIP

For One or Both Hands.

Pronounced by Physicians, Inspectors, and Teachers as "THE BEST."



Reduced Facsimile of **Left-Hand** Writing by a Child of 8.

Specimen Copies, with full Particulars of Competition, on application.

SIMPKIN, MARSHALL, HAMILTON, KENT & CO., Ltd.,
32 Paternoster Row, London, E.C.

The Editor's Bookshelf.

HANDICRAFTS IN THE HOME.

MESSRS. METHUEN have just issued a handsome volume under the above title, which has a distinct educational as well as a general appeal; and many of our readers who are desirous of following the newer methods in educational matters will find the book full of suggestions for school handicrafts of a novel character.

The authoress, Mabel Tuke Priestman, who hails from the more intelligent and progressive side of the Atlantic, expresses herself on the matter of modern domestic *ennui* with a charming *naïveté*.

"There are some women," she says, "that have so little in their lives that the pity of it is overwhelming. When the daily household duties have been attended to they are entirely without resource. In the winter they sit in a chair by the window, with the shade almost down, peeping at the passers-by; and in the summer they rock for hours in the porch. They frequent the waiting-rooms of the railway station and large stores, merely to kill time and to watch those around them. If a love for making useful things could be brought to such people their entire outlook would be changed, and life would become more full of meaning."

The various subjects dealt with are as follows:—Piercing sheet metal, repoussé work, etching on metal, pottery making, wood and chip carving, stencil craft, stencilling by means of acids, block printing, batik (an ancient Javanese handicraft), leather work, pyrography, marine mosaic, home-made furniture, hand-woven rugs, fancy-pattern weaving, crocheted rugs, pulled rugs, bladed drawn work, netting, old-time quilting, artistic darning, ribbon work, raffia needlework, and appliqué. The book is fully illustrated with examples of finished work in great variety; but the number of subjects dealt with does not, as a rule, allow for that amount of detailed description which necessitates the insertion of diagrams drawn to scale.

"Good wood-carvers," we read in the very interesting chapter on "Chip-Carving," "are often found among children. I have seen work of boys and girls of eight years old, at the Public School of Industrial Art at Philadelphia, which compares favourably with that of many adults. There is a freedom and spontaneity about the work which always distinguishes the child trained in Liberty Tadd's methods. This consists in training both hands equally, and in teaching the children to draw, model in clay, and carve. The pupil works in each of these studies for a short time, changing from one to the other in an afternoon."

Now all this is on right lines, provided that the budding craftsman has the courage to destroy his first efforts, or at least to hide them effectually. It is the premature exhibition which discredits amateur handicraft. After all, the educational value of the pursuit is the general training in handiness rather than the production of anything. "The life of a craft-worker gradually grows more and more sincere as the love for good, honest workmanship develops the worker, and she becomes dissatisfied with the commonplace and is more in earnest in all she undertakes." This is, of course, a truism, and is not even expressed as an epigram; but it is a truism which requires frequent repetition.

Some of our readers may be wondering what marine mosaic is. It is a "new and original scheme of decoration, which consists of a clever adaptation of shells, stones, and glass, strongly cemented, to form beautiful effects in colour and unique features in design. It is novel in showing a development in the penetration of light through objects so arranged as to illuminate in a pictorial manner the harvest of the sea." So we can "gather pebbles on a boundless shore" to some purpose for the future, and the shells brought from the coast in the summer vacation can be put to a practical and tasteful use. The decorative window treatment by means of these mosaics, which is shown in this chapter, is very beautiful, and for shutting out an ugly view we can strongly recommend the plan.

We hope we have said enough to induce many of our readers to provide against the winter evenings by investing in this guide to the banishment of dull care. Most of us require activity as an antidote to boredom, for only one man in a thousand can say with Burns, "I have been happy, thinking."

A THRILLING STORY.

MR. JOHN BUCHAN'S new novel, *Prester John* (Nelson's Two Shilling Novels), provides a welcome relief from the ordinary type of story. It contains no woman, properly so called, and we confess that we do not miss her; for in such a tale of action the eternal feminine is superfluous, even as a reward. The tale is South African in setting, though it begins in Scotland, where the hero and his friends were "boys together," and played truant from the kirk. How they baited the missionary is excellently told in the opening chapter. For the rest, the action lies in the land of mystery and romance, which is slowly but surely being subjected to the yoke of civilisation. We have it on the assurance of our only poet that "East is East, and West is West, and never the twain shall meet." But North meets South in the person of Mr. Buchan's black parson, the Rev. John Laputa, who is genius enough to reconcile the characteristics of both, to be the successor of Prester John, and to act a competent part in the somewhat less romantic atmosphere of kirk life in a small Scottish town.

This handsome volume has already to our knowledge been requisitioned as a school prize, and has received a very warm welcome from the Education Authorities in South Africa. Of course Mr. Buchan has first-hand knowledge of the country, and so "writes of the little things he knows about"—a rare quality in those days.

THE SPORTS HOUSE OF THE WORLD.

We issue Specially-Illustrated Departmental Catalogues of the following departments, any of which may be obtained free on application.

Sports and Games.
Horticultural, Poultry Appliances, and Live Stock.
Guns and Fishing Tackle, Taxidermy, and everything for the Naturalist.
Tools, Lamps, Gas and Electric Fittings.
Cycles, Cycle Accessories, Cycle Clothing, &c.
Motor Clothing and Accessories.
Baby Carriages, Cots, Chairs, and Kindergarten Furniture.
Jewellery, Fancy Goods, Stationery, Books, etc.
Bags and Trunks and all Travelling and Camping Equipment.
Toys & Musical Instruments.
Drugs and Toilet Requisites.
Cigars, Tobacco, Pipes, etc.
Furniture, China and Glass, and Household Requisites.
Fitted Luncheon Baskets, &c.
Photography, Magic Lanterns, and Optical Goods.
Conjuring and Magic.
Sale Lists (Twice Yearly).
'Xmas Presents List.

GENTLEMEN'S OUTFITTING.
Tailoring, Hats and Caps, Waterproofs, Athletic Clothing, Boots and Shoes, Hosiery, Shirts, Collars, Ties, Umbrellas, Sticks, &c.

GAMAGES HOLBORN AND BENETFINKS CHEAPSIDE

ALL TEACHERS,

both of juniors and seniors, will find among our publications at least one that will be useful. "Easy Modelling for Infants," 8d., post free. "Plastic Methods for Plastic Minds," 1s. 3d., post free. "Geographical Modelling," 3d., post free. "Modelling for the Standards," 1s. 6d., post free. Send for list and particulars to Wm. Harbutt, A.R.C.A., 215 Bathampton, Bath.

DELICIOUS COFFEE

RED WHITE & BLUE

FOR BREAKFAST & AFTER DINNER.

In making, use less quantity, it being so much stronger than ordinary COFFEE.

CATCH THE MOTH . .
and Prevent the Caterpillar Plague in the Spring. . .
by applying

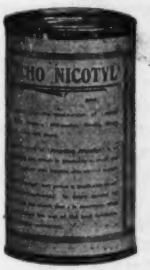
VOSS' FRUIT TREE BANDING GREASE

during September and October.

A sure remedy for the Caterpillars of the Winter, Mottled Umber, and March Moths.

In tins, 1/- and 2/6 (1/4 and 3/-, post free); 28 lbs., 9/-; 56 lbs., 16/-; 1 cwt., 30/-.
Grease Proof Bands, 20, 3d.; 60, 6d.; 120, 1/- (4½d., 9d., and 1/4, post free).

SOIL PESTS



such as . .
Wireworms, Leatherjackets, Millepedes, Slugs, Julus Worms, etc.,
should be destroyed by using

NAPTHO NICOTYL,

an Absolute Certain Remedy.

The Reliable Soil Fumigant.

An Original Invention, not an imitation. Based on practical tests, and a thorough experience of insects and other pests.
In tins, 6d. (post free, 10d.) and 1/6; 28 lbs., 3/6; 56 lbs., 6/6; 1 cwt., 10/-.

Sole Manufacturers . .
WALTER VOSS & CO., LTD., MILLWALL, LONDON, E.C.
Write for List.

THE SCHOOLMISTRESS

WEEKLY PRICE ONE PENNY. CONTAINS **HELPFUL ARTICLES ON ALL BRANCHES OF SCHOOL WORK.** WEEKLY PRICE ONE PENNY.

TEACHERS not already Subscribers should order from their Newsagent, or forward Postal Order or Halfpenny Stamps to
"THE SCHOOLMISTRESS" NEWSPAPER CO., Ltd.,
149 Fleet Street, E.C.

SUBSCRIPTIONS (Prepaid).
ONE SHILLING AND NINEPENCE for THREE MONTHS.
THREE SHILLINGS AND THREEPENCE for SIX MONTHS.
SIX SHILLINGS for TWELVE MONTHS.
— Post Free. —

The Best Paper for Pupil Teachers and all Mistresses.
Full Notes on Certificate Literature.

TELEGRAPHIC ADDRESS: "SCHOOLMISTRESS, LONDON." Address: **PUBLISHER, 149 Fleet Street, LONDON, E.C.**

NELSON'S NEW NOVELS. 2/- NET.

LATEST VOLUMES—

LADY GOOD-FOR-NOTHING. By "Q."

PANTHER'S CUB. By A. and E. CASTLE.

AT ALL BOOKSELLERS & BOOKSTALLS.

DAN AND UNA ONCE AGAIN.

THERE are eleven stories in Mr. Kipling's new volume, *Rewards and Fairies* (Macmillan and Co., Limited), and twice as many sets of verses. The former have a certain unity, imparted by the presence of our old friends, Dan and Una, the mortal hero and heroine of *Puck of Pook's Hill;* but the device is somewhat slender, and one is not quite sure that the rule of simplicity—the golden rule in literature—would not have been better observed by its omission.

The true spirit of the craftsman pervades the chapter entitled "The Wrong Thing," which is one of the best of the bunch in our opinion, though we may be biassed by the trend of matters educational at the present moment. Here is the spirit of it:—

"An' I don't mind tellin' you, Mus' Dan," he said, "that the Hall will be my last job top of this mortal earth. I didn't make ten pounds—no, nor yet five—out o' the whole contrac', but my name's lettered on the foundation-stone—*Ralph Springett, Builder*—and the stone she's bedded on four foot good concrete. If she shifts any time these five hundred years, I'll sure-ly turn in my grave. I told the Lunnon architec' so when he come down to oversee my work."

There is a smell of the English countryside about these stories, and especially of the late autumn and early winter, when the odour of the wood fires is in the air. It is the old enchantment, the spell of which the wizard weaves so well; and whatever he has to tell us we must listen perforce. We recommend all our readers to recreate the romance of things by reading the book leisurely during the coming holidays. Many of the verses, too, will stick in the memory.

"One man in a thousand, Solomon says,
Will stick more close than a brother;
And it's worth while seeking him half your days,
If you find him before the other.
Nine hundred and ninety-nine depend
On what the world sees in you;
But the Thousandth Man will stand your friend
With the whole round world agin you."

A New School Atlas of Modern History. By Ramsay Muir, M.A. (*George Philip and Son.*)

This book will be a positive boon to the student of history and geography. "The teaching of modern history," says the editor, "whether English, European, American, or Colonial, has long been handicapped in England by the non-existence of a carefully produced historical atlas, covering the whole ground and issued at a price which will place it within the reach of all schools. This gap the present work endeavours to fill, as Pützger's excellent work fills it in Germany." The present volume is much more than an atlas. The introduction deals in turn with (1) maps of Europe and the Mediterranean basin, (2) the growth of the principal States of Europe, (3) the British Isles, and (4) the Europeanisation of the world, the whole being illustrated with twenty-nine excellent sketch-maps and battle-plans in black and white. This is followed by the coloured plates, arranged under four similar general headings, and tracing in detail the history of the world. The colouring of the maps is beautifully clear, and the typography is a triumph of its kind. No student of home and foreign history can afford to be without this valuable guide.

Practical Geography: For Secondary and Supplementary Schools. By James Miller, M.A., and William Millar, M.A., D.Sc. (*G. Bell and Sons.* 114 *pp.* 2*s.*)

Of the many books which have lately been published dealing with this subject, this is certainly one of the best. A special feature of the book is that most of the practical work can be carried out without the assistance of expensive apparatus, and most of that which is necessary may be easily constructed by the pupils themselves. The whole matter and exercises call for our unqualified approval.

Indian Basket Work. By Isabel A. Otty. (*E. J. Arnold and Son.*)

This handsome volume is described as "an original adaptation, for school use, of the methods of work and of patterns done by the Red Indians." At first it seems a far cry to the land of the West; but Longfellow's beautiful poem "Hiawatha," which is now being largely used in infants' schools, provides the connecting link necessary for modern methods, so all is well. The book is so well planned, so helpful, and so intrinsically interesting, that the editor has asked the authoress to write an article on the method for an early number of the *Practical Teacher*. Meanwhile, those of our readers who cannot wait for the appearance of that paper are recommended to write to Messrs. Arnold of Leeds, and ask for particulars of the volume named above.

Red Cap Tales—Ivanhoe. By S. R. Crockett. (*A. and C. Black.*)

This is a volume of stories "told from" *Ivanhoe* by the well-known novelist who gave us *The Lilac Sunbonnet*, *Cleg Kelly*, and other delights. If Scott must be approached in this manner, the work ought to be done as Mr. Crockett does it; but there is something amiss if the "Wizard of the North" can no longer weave his own spell.

Peeps at Many Lands—Russia. By L. Edna Walter. (*A. and C. Black.*)

Here is a bright-colour book for children which tells of the land and people ruled over by the Tsar. The whole subject is treated from the humanistic point of view, and the various chapters are packed full of living interest. We congratulate the writer on a deft touch with the pen, and a real facility for selecting what really matters.

TO A CARPER.

If foes my character impeach,
And warn thee what my failings be,
Suffer my friend in turn to teach
That Virtue hath *some* part in me.

If Slander hold me up to wrath,
Or Fame weave laurels for my brow,
I'd have to choose the middle path,
And think I am a man—as thou.

From the German.

HISTORY MAPS.

A NEW SERIES IS IN PREPARATION, AND WILL BE READY SHORTLY.

BOLD FEATURES. CONVENIENT IN SIZE. MODERATE IN PRICE.

COMPRISING ALL ESSENTIAL GEOGRAPHICAL DETAILS RELATING TO BRITISH AND EUROPEAN HISTORY.

WRITE FOR PROSPECTUS.

W. & A. K. JOHNSTON, LIMITED,
6 PATERNOSTER BUILDINGS, LONDON, E.C.; and EDINBURGH.

J. POOLE & Co.,
104 Charing Cross Road,
and 2 Manette Street,
LONDON, W.C.
Established 1854.

All Inquiries Answered.
WRITE TO US FOR A QUOTATION.
Books Bought.

Books for all Exams.

SCHOOL,
CLASSICAL,
FOREIGN,
SCIENTIFIC,
MATHEMATICAL, Etc.,
BOOKS,
NEW AND SECOND-HAND.

Educational Books, Keys and Translations.

EVANS' ANTISEPTIC THROAT PASTILLES

ALL SCHOOL TEACHERS, PUBLIC SPEAKERS, SINGERS, &c.
whose vocation so predisposes them to chronic inflammation and soreness of the throat, will find these world-famous Throat Pastilles a perfect boon. Composed of ingredients suggested by an eminent Throat Specialist and prepared to a formula of the Liverpool Throat Hospital, their peculiar properties are singularly effective and beneficial in all cases of Loss of Voice, Hoarseness, or Irritation of the vocal organs. They impart clearness and tone to the voice.
To be obtained of all Stores, Chemists, etc., at 1s. and 4s. 6d. per box.
Send 1d. stamp (to cover postage) for sample box and list of testimonials to
EVANS SONS LESCHER & WEBB, Ltd., LIVERPOOL.

Notices to Advertisers.

¶ **Secretaries of Education Authorities** are kindly asked to note that regular readers of the *Practical Teacher* are among the best teachers in the country. "*Posts Vacant*" ought to be advertised in our columns.

¶ **School Publishers** have again and again proved the efficacy of a well-worded announcement in the advertisement section of the *Practical Teacher*. The journal has a large circulation not only in primary but also in lower secondary and private schools.

¶ **Progressive Teachers** want the most up-to-date School Equipment. Makers of School Furniture and Educational Appliances of all kinds ought to advertise in the *Practical Teacher*, which is regularly read by Directors, Inspectors, and Secretaries of Education.

CHARGES FOR ADVERTISEMENTS.

	£	s.	d.
Page (Ordinary)	5	5	0
Back Page	6	6	0
Half Page	2	12	6
Quarter Page	1	7	6
One-eighth Page	0	15	0

*** *Special Terms for Series on application.*

THE PRACTICAL TEACHER is published on the 25th of each month. Advertisements should reach the Office not later than the 10th of the month.

THOMAS NELSON AND SONS, 35 and 36 Paternoster Row, London, E.C.

NELSON'S

New Prize and Reward Books, 1910-11.

Handsome Gift Books—Illustrated in Colours.

6/- NET. **THE LAND AND THE BOOK.**

By Dr. W. M. THOMSON. A New Edition of the most popular work on Bible Lands and Customs ever published. Revised by JULIAN GRANDE, F.R.G.S. This has always been an immensely popular Gift Book, and this New Edition should make it more popular than ever. *Twelve Specially Painted Coloured Pictures.*

6/- NET. **MEN OF MARK IN THE HISTORY OF EUROPE.**

By RICHARD WILSON, B.A. Suitable for both Boys and Girls.
Thirty-two Striking Coloured Pictures.

5/- NET. **THE GATEWAY TO TENNYSON.**

A delightful introduction for young people to the Works of the great Poet.
Numerous Coloured and other Plates—Marginal Illustrations.

3/6 OFF THE WICKET.
By HAROLD AVERY. Olivine edges.

3/6 THE INSURGENT TRAIL.
By TOM BEVAN. Olivine edges.

3/6 STORY OF A BRAVE CHILD.
Children's Life of Joan of Arc. With coloured frontispiece and 8 black-and-white plates after eminent artists. Uniform with "Queen Bee," etc.

3/6 A SCOUT'S SON.
By C. TURLEY.

3/6 FOR LOVE AND HONOUR.
32 coloured plates.

2/6 ONCE BITTEN, TWICE SHY.
By FRED WHISHAW. Olivine edges.

2/6 THE FORTUNES OF FLOT.
By Miss PURDON. Olivine edges.

2/6 BOSOM FRIENDS.
By ANGELA BRAZIL. Olivine edges.

2/6 THE JOLLY BOOK: Nelson's Children's Annual.

2/6 MILK-WHITE THORN.
32 coloured plates and numerous side-cuts.

Also New Editions in all Libraries, Beautifully Bound and Illustrated.

Complete New Gift Book List Now Ready.

THOMAS NELSON & SONS,

LONDON, EDINBURGH, DUBLIN, LEEDS, PARIS, LEIPZIG, AND NEW YORK.